



Dannel P. Malloy
Governor

STATE OF CONNECTICUT
DEPARTMENT OF HOUSING



Evonne M. Klein
Commissioner

**Community Development Block Grant Disaster Recovery
Program (CDBG-DR)**

**Owner Occupied Rehabilitation and Rebuilding Program
(OORR)**

BID PACKAGE

For

Rehabilitation/Reconstruction work for:

Ron Terebisi

91 Dogwood Drive

Easton, CT 06612

Prepared By:

Martinez Couch & Associates, LLC

1084 Cromwell Avenue Suite A-2

Rocky Hill, CT

860-436-4364

Project #: 1111 – 91 Dogwood Drive



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Section 1

ADVERTISEMENT FOR BIDS

Project # 1111 – 91 Dogwood Drive

DOH: _____

The State of Connecticut Department of Housing (DOH) is seeking proposals through a Request for Proposal (RFP) process for the rehabilitation, reconstruction and/or mitigation of residential structures damaged by Superstorm Sandy in compliance with all applicable local, federal, and state statutory requirements with special attention paid to requirements for Community Development Block Grants under the United States Department of Housing and Urban Development (“HUD”) Disaster Recovery grant program.

Separated sealed bids for 1111 91 Dogwood Drive will be received by Martinez, Couch and Associates LLC until 5 o’clock AM/PM on July 23, 2014, and then at said office publicly opened and read aloud.

The Information to Bidders, Form of Bid, Form of Contract, Plans, Specifications, and Form of Bid Bond, Performance and Payment Bond, and other contract documents may be examined on the Department of Housing Hurricane Sandy Recover website at www.ct.gov/doh/ and click on the “Hurricane Sandy” link.

Copies of plans may be downloaded directly from the Department of Housing website under bid notices or obtained at the office of Martinez, Couch and Associates LLC located at 1084 Cromwell Avenue Suite A-2, Rocky Hill, CT 06067 upon payment of \$50 for each set. Requests for copies of plans shall provide 2 business days notice to Martinez, Couch and Associates, LLC.

DOH reserves the right to waive any informalities or to reject any or all bids.

Each bidder must deposit with his bid, security in the amount, form and subject to the conditions provided in the Information to Bidders.

Attention to bidders is particularly called to the requirements as to conditions of employment to be observed and minimum wages rates to be paid under the contract (if applicable), Section 3, Segregated Facilities, Section 109 and E. O. 11246.

No bidder may withdraw his bid within 30 calendar days after the actual date of the bid opening thereof.

INFORMATION FOR BIDDERS

Receipt and Opening of Bids:

The State of Connecticut Department of Housing (herein called the "DOH"), invites bids on the form attached hereto, all blanks of which must be appropriately filled. Bids will be received by DOH at the office of Martinez, Couch and Associates, LLC until 5 o'clock PM on July, 23, 2014 and then at said office publicly opened and read aloud. The envelopes containing the bids must be sealed, addressed to Mr. Richard Couch, P.E. at Martinez, Couch and Associates, LLC and designated as bid for 1111 – 91 Dogwood Drive, Easton, CT.

DOH may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement there considered. NO bidder may withdraw a bid within 30 days after the actual date of the opening thereof.

Mandatory Walk Through: All bidders must attend a mandatory walk through of the property designated above. The date and time of the walk through is set for 12:00 o'clock Noon on July 9, 2014.

Preparation of Bids:

Each bid must be submitted on the prescribed form and accompanied by Certification by Bidder Regarding Equal Employment Opportunity, Form HUD-950.1, and Certification of Bidder Regarding Section 3 and Segregated Facilities. All blank spaces for bid process must be filled in, in ink or typewritten, in both words and figures, and the foregoing Certifications must be fully completed and executed when submitted.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his/her address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form.

Subcontracts: The bidder is specifically advised that any person, for, or other party to whom it is proposed to award a subcontract under this contract:

1. Must be acceptable to the DOH after verification by the State of the current eligibility status; and,
2. Must submit Form HUD-950.2, Certification by Proposed Subcontractor Regarding Equal Employment Opportunity and Certification of Proposed Subcontractor Regarding Section 3 and Segregated Facilities. Approval of the proposed subcontractor award cannot be given by the DOH unless and until the proposed subcontractor has submitted the Certifications and/or other evidence showing that it has fully complied with any reporting requirements to which it is or was subject. Although the bidder is not required to attach such Certifications by proposed subcontractors to his/her bid, the bidder is here advised of this requirement so that appropriate action can be taken to prevent subsequent delay in subcontract awards.

Method of Bidding: DOH invites the following bid(s):

Qualifications of Bidder: The DOH may make such investigations as he/she deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the DOH all such

information and date for this purpose as the DOH may request. The DOH reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the DOH that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids will not be accepted. The State's set Contractor Prequalifications are listed in Exhibit G and also are available at the Department of Housing's Hurricane Sandy Recovers website www.ct.gov/doh/ and click on the "Hurricane Sandy" link.

Bid Security: Each bid must be accompanied by an irrevocable letter of credit from the bank, certified check, or bank cashier's check in the amount not less than five percent (5%) of the bid. Bid bonds may be accepted as bid security. Such checks will be returned to all except the three lowest bidders within three days after the opening of bids, and the remaining cash, or checks will be returned promptly after DOH and the accepted bidder have executed the contract, or opening of bids, upon demand or the bidder at any time thereafter, so long as he/she has been notified of the acceptance of his/her bid.

Conditions of Work: Each bidder must inform him/herself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his/her obligation to furnish all material and labor necessary to carry out the provision of his/her contract. Insofar as possible the contractor, in carrying out the work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

Addenda and Interpretations: No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally.

Every request for such interpretation should be in writing addressed to: Mr. Richard Couch, P.E. at Martinez, Couch and Associates, LLC and to be given consideration must be received at least seven days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instruction will be in the form of written addenda to the specifications which, if issued, will be forwarded by electronic mail and posted on DOH's Hurricane Sandy website to all prospective bidders (at the respective email addresses furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his/her bid as submitted. All addenda so issued shall become part of the contract documents.

Security for Faithful Performance: Simultaneously with his/her delivery of the executed contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the DOH.

Performance and Payment Bonds: A performance and payment bond will be required of the successful bidder (contractor) for 100 percent of the contract price on contracts over \$100,000.

Contract Progress Schedule: Each bid shall be accompanied by a Contract Progress Schedule. Such Schedule shall list the bidder's timetable for completion of the contract.

Power of Attorney: Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

Notice of Special Conditions: Attention is particularly called to those parts of the contract documents and specifications which deal with the following:

1. Inspection and testing of materials
2. Insurance requirements
3. Wage rates (if applicable)
4. State allowances

Laws and Regulations: The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

Method of Award-Lowest Qualified Bidder: If at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds then estimated by the DOH as available to finance the contract; the contract will be awarded on the base bid only. If such bid exceeds such amount, the DOH may reject all bids or may award the contract on the base bid combined with such deductible alternatives applied in numerical order in which they are listed in the Form of Bids, as produces a net amount which is within the available funds.

If the homeowner wishes to select a prequalified bidding contractor other than the lowest and most responsible bidder, said owner is responsible for paying the difference between the lowest bidder and their chosen bidder from their own financing.

Obligation of Bidder: At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect to his/her bid.

Safety Standards and Accident Prevention: With respect to all work performed under this contract, the contractor shall:

1. Comply with the safety standards provision of applicable laws, building and construction codes and the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970 (Public Law 91-596), and the requirements of Title 29 of the Code of Federal Regulations, Section 1518 as published in the "Federal Register," Volume 36, No 75, Saturday, April 17, 1971.
2. Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) who may be injured on the job site before the employer has made a standing arrangement for removal of injured persons to a hospital or a doctor's care.

BID FORM

The undersigned, being familiarized with the local conditions affecting the cost of the work and with the Drawings, Specifications, Invitation to Bidders, Instructions to Bidders, General Conditions, Bid Form, Form of Contract and Form of Bonds for Project No. 1111 – 91 Dogwood Drive Easton, CT and Addenda No. _____ and _____ thereto, as prepared by Martinez, Couch and Associates, LLC, Connecticut, and on file in the office of DOH, hereby proposes to furnish all permits, labor, materials, tools, equipment, and related items required for the rehabilitation and reconstruction for said Project No. 1111 – 91 Dogwood Drive Easton, CT located at 91 Dogwood Drive in Easton, CT, State of Connecticut, all in accordance with the Drawings and Specifications, for the sum of:

_____ Dollars (\$))

Section #	Scope of Work	Subcontractor	Cost	
			\$ / Per	Total (\$)
	General Conditions		/L.S.	
01 50 00	Temporary Facilities		/L.S.	
02 82 13	Asbestos Abatement		/L.S.	
02 83 13	Lead Paint		/L.S.	
02 85 00	Mold Remediation		/L.S.	
06 10 00	Rough Carpentry		/L.S.	
06 40 00	Architectural Woodwork		/L.S.	
07 31 00	Asphalt Shingles		/L.S.	
07 71 00	Building Insulation		/S.F.	
09 29 00	Gypsum Board		/S.F.	
09 30 00	Tiling		/S.F.	
09 90 00	Paintings Coatings		/S.F.	
09 93 00	Staining and Transparent Finishes		/S.F.	
22 10 60	Plumbing		/L.S.	
23 00 50	HVAC		/L.S.	
26 00 60	Electrical		/L.S.	
TOTAL COST				

Unit Prices - For Unforeseen Conditions During Repairs

All unit prices, unless otherwise noted, shall include all incidental work normally required in connection with the particular type of work involved and would include, but not necessarily be limited to costs of materials, material accessories, material waste, fabrication, labor, supervision, engineering, layout, transportation, rigging, insurances, overhead, and profit. All labor rates, unless otherwise noted, shall include, but not necessarily be limited to all fringe benefits, insurances, overhead, and profit.

Item	Rate (\$/Per)
Rofer Labor Rate	/H.R.

The undersigned agrees to commence the work on a date to be specified in the contract and to complete such work within 120 consecutive calendar days.

The undersigned agrees that if within the period of thirty (30) calendar days after the opening of bids, or when extended to the next work day immediately following said period, notice of the acceptance of this bid shall be mailed, or delivered to him/her at the business address given below, or at any time thereafter before this bid is withdrawn, _____, will within fifteen (15) calendar days thereafter deliver to DOH, where directed, a contract properly executed in such number of counterparts as may be required by said DOH, on the forms annexed, with such changes therein as shall have been made by the DOH, prior to the time named for delivery of this proposal, together with a 100% Performance Bond of a Surety Company, which Surety must be authorized to transact business in the State of Connecticut, and duly qualified therefore, and in the form constituting part of the Specification and a letter indicating those Small/Minority Business Enterprises that will perform work and/or provide materials, equipment or services as part of the contract.

In submitting this bid, it is understood that the right is reserved by the abovementioned DOH to reject any and all bids; and it is agreed that this bid may not be withdrawn for a period of thirty calendar (30) days from the date of bid opening or until the next work day immediately following said period if such period ends on weekend or a State holiday.

Security in the sum of _____ Dollars (\$ _____)

in the form of _____ is submitted herewith in accordance with the Specifications.

The undersigned bidder agrees to comply with the Section 3 plan included herein and all Federal requirements pertaining to conditions of employment to be observed and minimum wage rates to be paid under the contract, Segregated Facilities, Section 109 and Executive Order 11246.

Attached hereto is an affidavit, in proof that the undersigned has not entered into any collusion with any person in respect to this proposal, or any other proposal, or the submitting of proposals for the above Project. Also attached is a statement of contractor's qualifications, Certification of Bidder Regarding Equal Employment Opportunity, Certification of Bidder Regarding Section 3 and Segregated Facilities.

Date

Firm Name

Address

By: _____

Title: _____

(Bank Letterhead)

BID SECURITY

IRREVOCABLE LETTER OF CREDIT

Dear _____:

We hereby authorize you to draw on us to the aggregate amount of \$_____ (five percent of the amount of the bid) in the event _____ withdraws its bid within the bid holding period, or upon being awarded a contract, fails to provide adequate performance and payment security as required by the Contract documents.

Such drafts must be accompanied by the following document:

A written certification by you that the proceeds of any draft drawn on this Letter of Credit will be used solely to indemnify the DOH against loss or damage suffered by it resulting from any act or omission described in the above paragraph.

We warrant to you that all drafts drawn in compliance with the terms of this Letter of Credit will be unconditionally and duly honored upon delivery of the documentation specified and presented to this office.

This Letter of Credit is irrevocable and shall be in full force and effect until notification in writing is received from you that a contract for Project 1111 – 91 Dogwood Drive Easton, CT has been awarded and executed, whereupon this Letter of Credit shall automatically be canceled.

This Letter of Credit shall not be modified or amended except upon the written agreement of this Bank and the DOH.

Sincerely yours,

President

FORM OF NON-COLLUSIVE AFFIDAVIT

AFFIDAVIT

State of _____)

County of _____)

_____, being first duly sworn, deposes and says:

That he/she is, _____ the party making the foregoing proposal for bid, that such proposal or bid is genuine and not collusive or sham; that said bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not, in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or of any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against DOH or any person interested in the proposed contract, and that all statements in said proposal for bid are true.

Project No. 1111 – 91 Dogwood Drive Easton, CT

Location 91 Dogwood Drive, Easton, CT

Signature

Name and Title

Date

(Signature should be notarized.)

BIDDER'S CERTIFICATION OF ELIGIBILITY

By the submission of this bid, the bidder certifies that to the best of its knowledge and belief, neither it, nor any person or firm which has an interest in the bidder's firm, nor any of the bidder's subcontractors, is ineligible to:

- (1) Be awarded contracts by any agency of the United States Government or HUD; or,
- (2) Participate in HUD programs pursuant to 24 CFR part 24.

(Name of Bidder)

(Address)

BY: _____

Title: _____

NOTE: This certification is a material representation of fact upon which reliance is placed when making award. If it is later determined that the bidder knowingly rendered an erroneous certification, the contract may be terminated for default, and the bidder may be debarred or suspended from participation in HUD programs and other Federal programs.

CERTIFICATION OF GENERAL BIDDERS ON CDBG-DR CONSTRUCTION PROJECTS

I. CERTIFICATION REGARDING HEALTH AND SAFETY

The undersigned hereby certifies that he/she is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

II. CERTIFICATION REGARDING NON-COLLUSION AND DEBARMENT

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word “person” shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies that neither he/she nor any firm, corporation, partnership or association in which he/she has a substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6 (b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5), or pursuant to Section 3 (a) of the Davis-Bacon Act, as amended (40 USC 276a). The undersigned further certifies that said undersigned is not presently debarred from doing public construction work in the State of Connecticut.

Date: _____

Name of General Bidder

By _____

Signature

Print name and Title

Business Address

Street Address City and State

OSHA-10 OSHA-10

CERTIFICATION OF SUB- BIDDERS (IF ANY) ON CDBG-DR CONSTRUCTION PROJECTS

I. CERTIFICATION REGARDING HEALTH AND SAFETY

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupation Safety and Health Administration that is at least ten hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards of subcontracts subject to section 44F.

II. CERTIFICATION REGARDING NON-COLLUSION AND DEBARMENT

The undersigned further certifies under penalties of perjury that this subbid is in all responses bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the “person” shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies that neither he/she nor any firm, corporation, partnership or association in which he/she has a substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6 (b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5), or pursuant to Section 3 (a) of the Davis-Bacon Act, as amended (40 USC 276a). The undersigned further certifies that said undersigned is not presently debarred from doing public construction work in the State of Connecticut.

Date _____

Name of Sub-bidder

By _____

Signature

Print Name and Title

Business Name

Street Address, City and State

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____ as Principal, and _____ Surety, are hereby held and firmly bound unto _____ as DOH in the penal sum of _____, for the payment of which, well and truly be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns. Signed this _____ day of _____, 2014.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted to _____ a certain Bid, attached hereto and hereby made a part hereof to enter into a contract in writing, for the _____

NOW, THEREFORE,

1. If said Bid shall be rejected, or in the alternate,
2. If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with the Bid) and shall furnish a bond for this faithful performance of said contract, and for the payment of all person performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid,

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any or all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time which the DOH may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____ (L.S)
Principal

Surety

SEAL

By: _____

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: THAT we,

_____, as

PRINCIPAL, and _____, as SURETY,

are held firmly bound unto _____

_____ hereinafter called the DOH, in the penal
sum of _____

_____ (\$ _____), for the payment

of which sum we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally.

WHEREAS, Principal has entered into a certain Contract with DOH, dated _____, a copy of which is hereto attached and made a part hereof.

NOW, THEREFORE, the condition of this obligation is such that if the Principal shall in all respects fully perform the Contract and all duly authorized modifications thereof, during its original term and any extensions thereof that may be granted and during any guaranty period for which the Contract provides, and if the Principal shall fully satisfy all claims arising out of the prosecution of the work under the Contract and shall fully indemnify DOH for all expenses which it may incur by reason of such claims, including its attorney's fees and court costs, and if the Principal shall make full payment to all persons supplying labor, services, materials, or equipment in the prosecution of the work under the Contract, in default of which such persons shall have a direct right of action hereupon; and if the Principal shall pay or cause to be paid all sales and use taxes payable as a result of the performance of the Contract as well as payment of gasoline and special motor fuel taxes in the performance of the Contract and all motor vehicle fees required for commercial motor vehicles used in connection with the performance of the Contract, then this obligation shall be void; otherwise, it shall remain in full force and effect. No modification of the Contract or extension of the term thereof, nor any forbearance on the part of DOH shall in any way release the Principal or the Surety from liability hereunder. Notice to the Surety of any such modification, extension, or forbearance is hereby waived.

IN WITNESS WHEREOF, the aforesaid Principal and Surety have executed this instrument and affixed their seals hereto, this _____ day of _____.

Principal

Surety

Name and Title

(Signatures must be notarized.)

(Power-of-Attorney for person signing for Surety Company must be attached to bond.)

The rate of premium on this bond is \$_____ per thousand.

The total amount of premium charge is \$_____.

(The above is to be filled in by Surety Company.)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the
_____ Secretary of the corporation
named as Principal in the foregoing bond; that _____, who
signed the bond on behalf of the Principal, was then _____ of said
corporation; that I know his/her signature thereto is genuine; and that said bond was fully signed, sealed,
and attested for and in behalf of said corporation by authority of its governing body.

SUBCONTRACTOR IDENTIFICATION

(Provide additional forms for more subcontractors, as needed prior to execution.)

This form is a part of your bid package and must be submitted along with the itemized and formal bid forms at the time of the bid opening. Failure to submit a completed document could result in the disqualification of your bid.

Name of Subcontractor: _____

Address: _____

Trade: _____

Hourly Wage: \$ _____ Full Contract Price: \$ _____

Federal Tax# or SSN #: _____

Male Owned Business _____ Female Owned Business _____

Is he/she of Hispanic or Latino ethnicity? Yes _____ No _____

Race: (Please check one)

- White American Indian/Alaskan Native
 Black/African American Hasidic Jew
 Asian/Pacific American
-

Name of Subcontractor: _____

Address: _____

Trade: _____

Hourly Wage: \$ _____ Full Contract Price: \$ _____

Federal Tax# or SSN #: _____

Male Owned Business _____ Female Owned Business _____

Is he/she of Hispanic or Latino ethnicity? Yes _____ No _____

Race: (Please check one)

- White American Indian/Alaskan Native
 Black/African American Hasidic Jew
 Asian/Pacific American
-

Name of Subcontractor: _____

Address: _____

Trade: _____

Hourly Wage: \$ _____ Full Contract Price: \$ _____

Federal Tax# or SSN #: _____

Male Owned Business _____ Female Owned Business _____

Is he/she of Hispanic or Latino ethnicity? Yes _____ No _____

Race: (Please check one)

- White American Indian/Alaskan Native
 Black/African American Hasidic Jew
 Asian/Pacific American
-

Contractor's Signature

Date

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
CERTIFICATION OF BIDDER REGARDING EQUAL EMPLOYMENT
OPPORTUNITY

INSTRUCTIONS

This certification is required pursuant to Executive Order 11246 (30 F R 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless such report is submitted.

CERTIFICATION OF BIDDER

Name and address of Bidder (include zip code)

-
1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.
 YES NO
 2. Compliance reports were required to be filed in connection with such contract or subcontract.
 YES NO
 3. Bidder has filed all compliance reports due under applicable instructions, including SF.100.
 YES NO NOT REQUIRED
 4. Have you ever seen or are you being considered for sanction due to violation of Executive Order 11246, as amended?
 YES NO

NAME AND TITLE OF SIGNER (Please type.)

SIGNATURE

DATE

CERTIFICATION OF BIDDERS REGARDING SECTION 3 AND SEGREGATED FACILITIES

Project Name:

Project No:

Name of Prime Contractor:

The undersigned hereby certifies that:

1. Section 3 provisions are included in the Contract
2. A written Section 3 plan was prepared and submitted as part of the bid proceedings (if bid equals or exceeds \$100,000.00)
3. No segregated facilities will be maintained.

Name and Title of Signer (Print or Type)

Signature

Date

CONTRACTOR

Section 3 Plan Format

_____ agrees to implement the following specific affirmative action steps directed at increasing the utilization of lower income residents and business within the _____.

- A. To ascertain from the DOH the exact boundaries of the Section 3 covered project area and where advantageous, seek the assistance of local officials in preparing and implementing the affirmative action plans.
- B. To attempt to recruit from within the city the necessary number of lower income residents through: local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within or serving the project area such as Service Employment and Redevelopment (SER), Opportunities Industrialization Center (OIC), Urban League, Concentrated Employment Program, Hometown Plan, or the U. S. Employment Service.
- C. To maintain a list of all lower income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists.
- D. To insert this Section 3 plan in all bid documents, and to require all bidders on subcontracts to submit a Section 3 Affirmative Action Plan including utilization goals and the specific steps planned to accomplish these goals.
- E. To insure that contracts which are typically let on a negotiated rather than a bid basis in areas other than Section 3 covered project areas, are also let on a negotiated basis, wherever feasible, when let in a Section 3 covered project area.
- F. To formally contact unions, subcontractors and trade associations to secure their cooperation for this program.
- G. To insure that all appropriated project area business concerns are notified or pending subcontractural opportunities
- H. To maintain records, including copies of correspondence, memoranda, etc., that document all above affirmative action steps have been taken.
- I. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of the Section 3 plan.
- J. To list on Table A, information related to subcontracts to be awarded.
- K. To list on Table B, all projected workforce needs for all phases of this project by occupation, trade, skill level and number of positions.

As officers and representatives of _____

We, the undersigned, have read and fully agree to this Affirmative Action Plan, and become a party to the full implementation of this program.

Signature

Title

Date

Loans, grants, contracts and subsidies for less than \$100,000.00 will be exempt.

Table B

Estimated Project Workforce Breakdown

<i>Column 1</i>	<i>Column 2</i>	<i>Column 3</i>	<i>Column 4</i>	<i>Column 5</i>
Job Category	Total Estimated Population	No. Positions Currently Occupied by Permanent Employees	No. Positions Not Currently Occupied	No. Positions to be filled with LIPAR*
Officers/Supervisors				
Professionals				
Technicians				
Housing Sales/Rental Management				
Office Clerical				
Service Workers				
Others				
TRADE:				
Journeyman				
Helpers				
Apprentices				
Maximum No. of Trainees				
Others				
TRADE:				
Journeyman				
Helpers				
Apprentices				
Maximum No. of Trainees				
Others				
TRADE:				
Journeyman				
Helpers				
Apprentices				
Maximum No. of Trainees				
Others				
Total				

**Lower Income Project Area Residents. Individuals residing within the project area whose family income does not exceed 80% of the area median income in the SMSA.*

Company

Green Building Standards Checklist

HUD CPD Green Building Retrofit Checklist

The CPD Green Retrofit Checklist promotes energy efficiency and green building practices for residential retrofit projects. Grantees must follow the checklist in its entirety and apply all measures within the Checklist to the extent applicable to the particular building type being retrofitted. The phrase “when replacing” in the Checklist refers to the mandatory replacement with specified green improvements, products, and fixtures only when replacing those systems during the normal course of the retrofit.

WATER AND ENERGY CONSERVATION MEASURES

- | | |
|-----|---|
| N/A | <p>Water-Conserving Fixtures
Install or retrofit water conserving fixtures in any unit and common facility, use the following specifications: Toilets-- 1.28 gpf; Urinals-- 0.5 gpf; Showerheads-- 2.0 gpm; Kitchen faucets-- 2.0 gpm; and Bathroom faucets-- 1.5gpm. [gpf = gallons per flush; gpm = gallons per minute]</p> |
| N/A | <p>ENERGY STAR Appliances
Install ENERGY STAR-labeled clothes washers, dishwashers, and refrigerators, if these appliance categories are provided in units or common areas.</p> |
| N/A | <p>Air Sealing: Building Envelope
Seal all accessible gaps and penetrations in the building envelope. If applicable, use low VOC caulk or foam.</p> |
| X | <p>Insulation: Attic (if applicable to building type)
For attics with closed floor cavities directly above the conditioned space, blow in insulation per manufacturer's specifications to a minimum density of 3.5 Lbs. per cubic foot (CF). For attics with open floor cavities directly above the conditioned space, install insulation to meet or exceed IECC levels.</p> |
| N/A | <p>Insulation: Flooring (if applicable to building type)
Install \geq R-19 insulation in contact with the subfloor in buildings with floor systems over vented crawl spaces. Install a 6-mil vapor barrier in contact with 100% of the floor of the crawl space (the ground), overlapping seams and piers at least 6 inches.</p> |
| N/A | <p>Duct Sealing (if applicable to building type)
In buildings with ducted forced-air heating and cooling systems, seal all penetrations of the air distribution system to reduce leakage in order to meet or exceed ENERGY STAR for Homes' duct leakage standard.</p> |
| N/A | <p>Air Barrier System
Ensure continuous unbroken air barrier surrounding all conditioned space and dwelling units. Align insulation completely and continuously with the air barrier.</p> |
| N/A | <p>Radiant Barriers: Roofing
When replacing or making a substantial repair to the roof, use radiant barrier sheathing or other radiant barrier material; if economically feasible, also use cool roofing materials.</p> |

N/A

Windows

When replacing windows, install geographically appropriate ENERGY STAR rated windows.

X

Sizing of Heating and Cooling Equipment

When replacing, size heating and cooling equipment in accordance with the Air Conditioning Contractors of America (ACCA) Manuals, Parts J and S, or 2012 ASHRAE Handbook-- HVAC Systems and Equipment or most recent edition.

N/A

Domestic Hot Water Systems

When replacing domestic water heating system(s), ensure the system(s) meet or exceed the efficiency requirements of ENERGY STAR for Homes' Reference Design. Insulate pipes by at least R-4.

X

Efficient Lighting: Interior Units

Follow the guidance appropriate for the project type: install the ENERGY STAR Advanced Lighting Package (ALP); **OR** follow the ENERGY STAR MFHR program guidelines, which require that 80% of installed lighting fixtures within units must be ENERGY STAR-qualified or have ENERGY STAR-qualified lamps installed; **OR** when replacing, new fixtures and ceiling fans must meet or exceed ENERGY STAR efficiency levels.

X

Efficient Lighting: Common Areas and Emergency Lighting (if applicable to building type)

Follow the guidance appropriate for the project type: use ENERGY STAR-labeled fixtures or any equivalent high-performance lighting fixtures and bulbs in all common areas; **OR** when replacing, new common space and emergency lighting fixtures must meet or exceed ENERGY STAR efficiency levels. For emergency lighting, if installing new or replacing, all exist signs shall meet or exceed LED efficiency levels and conform to local building codes.

N/A

Efficient Lighting: Exterior

Follow the guidance appropriate for the project type: install ENERGY STAR-qualified fixtures or LEDs with a minimum efficacy of 45 lumens/watt; **OR** follow the ENERGY STAR MFHR program guidelines, which require that 80% of outdoor lighting fixtures must be ENERGY STAR-qualified or have ENERGY STAR-qualified lamps installed; **OR** when replacing, install ENERGY STAR compact fluorescents or LEDs with a minimum efficacy of 45 lumens/watt.

INDOOR AIR QUALITY

N/A

Air Ventilation: Single Family and Multifamily (three stories or fewer)

Install an in-unit ventilation system capable of providing adequate fresh air per ASHRAE 62.2 requirements.

N/A

Air Ventilation: Multifamily (four stories or more)

Install apartment ventilation systems that satisfy ASHRAE 62.2 for all dwelling units and common area ventilation systems that satisfy ASHRAE 62.1 requirements. If economically feasible, consider heat/energy recovery for 100% of corridor air supply.

N/A

Composite Wood Products that Emit Low/No Formaldehyde

Composite wood products must be certified compliant with California 93120. If using a composite wood product that does not comply with California 93120, all exposed edges and sides must be sealed with low-VOC sealants.

- | | |
|-----|---|
| X | Environmentally Preferable Flooring
When replacing flooring, use environmentally preferable flooring, including the FloorScore certification. Any carpet products used must meet the Carpet and Rug Institute's Green Label or Green Label Plus certification for carpet, pad, and carpet adhesives. |
| X | Low/No VOC Paints and Primers
All interior paints and primers must be less than or equal to the following VOC levels: Flats--50 g/L; Non-flats--50 g/L; Floor--100 g/L. [g/L = grams per liter; levels are based on a combination of the Master Painters Institute (MPI) and GreenSeal standards.] |
| X | Low/No VOC Adhesives and Sealants
All adhesives must comply with Rule 1168 of the South Coast Air Quality Management District. All caulks and sealants must comply with regulation 8, rule 51, of the Bay Area Air Quality Management District. |
| N/A | Clothes Dryer Exhaust
Vent clothes dryers directly to the outdoors using rigid-type duct work. |
| X | Mold Inspection and Remediation
Inspect the interior and exterior of the building for evidence of moisture problems. Document the extent and location of the problems, and implement the proposed repairs according to the Moisture section of the EPA Healthy Indoor Environment Protocols for Home Energy Upgrades. |
| X | Combustion Equipment
When installing new space and water-heating equipment, specify power-vented or direct vent combustion equipment. |
| N/A | Mold Prevention: Water Heaters
Provide adequate drainage for water heaters that includes drains or catch pans with drains piped to the exterior of the dwelling. |
| X | Mold Prevention: Surfaces
When replacing or repairing bathrooms, kitchens, and laundry rooms, use materials that have durable, cleanable surfaces. |
| N/A | Mold Prevention: Tub and Shower Enclosures
When replacing or repairing tub and/or shower enclosures, use non-paper-faced backing materials such as cement board, fiber cement board, or equivalent in bathrooms. |
| N/A | Integrated Pest Management
Seal all wall, floor, and joint penetrations with low-VOC caulking or other appropriate sealing methods to prevent pest entry. [If applicable, provide training to multifamily buildings staff.] |
| X | Lead-Safe Work Practices |

For properties built before 1978, if the project will involve disturbing painted surfaces or cleaning up lead contaminated dust or soil, use certified renovation or lead abatement contractors and workers using lead-safe work practices and clearance examinations consistent with the more stringent of EPA's Renovation, Repair, and Painting Rule and HUD's Lead Safe Housing Rule.

N/A

Radon Testing and Mitigation (if applicable based on building location)

For buildings in EPA Radon Zone 1 or 2, test for radon using the current edition of American Association of Radon Scientists and Technologists (AARST)'s Protocols for Radon Measurement in Homes Standard for Single-Family Housing or Duplexes, or AARST's Protocol for Conducting Radon and Radon Decay Product Measurements in Multifamily Buildings. To install radon mitigation systems in buildings with radon level of 4 pCi/L or more, use ASTM E 2121 for single-family housing or duplexes, or AARST's Radon Mitigation Standards for Multifamily Buildings. For new construction, use AARST's Reducing Radon in New Construction of 1 & 2 Family Dwellings and Townhouses, or ASTM E 1465.

Section 2: General Conditions for Construction Contracts

Based on HUD form 5370

Applicability. This form is applicable to any construction/development contract greater than \$100,000.

This form includes those clauses required by OMB's common rule on grantee procurement, implemented at HUD in 24 CFR 85.36, and those requirements set forth in Section 3 of the Housing and Urban Development Act of 1968 and its amendment by the Housing and Community Development Act of 1992, implemented by HUD at 24 CFR Part 135.

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1. Definitions

- (a) "Architect" means the person or other entity engaged by DOH to perform architectural, engineering, design, and other services related to the work as provided for in the contract. When DOH uses an engineer to act in this capacity, the terms "architect" and "engineer" shall be synonymous. The Architect shall serve as a technical representative of the Contracting Officer. The Architect's authority is as set forth elsewhere in this contract.
- (b) "Contract" means the contract entered into between DOH and the Contractor. It includes the forms of Bid, the Bid Bond, the Performance and Payment Bond or Bonds or other assurance of completion, the Certifications, Representations, and Other Statements of Bidders (form HUD-5370), these General Conditions of the Contract for Construction (form HUD-5370), the applicable wage rate determinations from the U.S. Department of Labor (when applicable), any special conditions included elsewhere in the contract, the specifications, and drawings. It includes all formal changes to any of those documents by addendum, change order, or other modification.
- (c) "Contracting Officer" means the person delegated the authority by DOH to enter into, administer, and/or terminate this contract and designated as such in writing to the Contractor. The term includes any successor Contracting Officer and any duly authorized representative of the Contracting Officer also designated in writing. The Contracting Officer shall be deemed the authorized agent of DOH in all dealings with the Contractor.
- (d) "Contractor" means the person or other entity entering into the contract with DOH to perform all of the work required under the contract.
- (e) "Drawings" means the drawings enumerated in the schedule of drawings contained in the Specifications and as described in the contract clause entitled Specifications and Drawings for Construction herein.
- (f) "DOH" means the State Department of Housing including the Commissioner, or any other person designated to act on its behalf.
- (g) "HUD" means the United States of America acting through the Department of Housing and Urban Development including the Secretary, or any other person designated to act on its behalf. HUD has agreed, subject to the provisions of an Annual Contributions Contract (ACC), to provide financial assistance to DOH, which includes assistance in financing the work to be performed under this contract. As defined elsewhere in these General Conditions or the contract documents, the determination of HUD may be required to authorize changes in the work or for release of funds to DOH for payment to the Contractor. Notwithstanding HUD's role, nothing in this contract shall be construed to create any contractual relationship between the Contractor and HUD.
- (h) "Grantee" means the State of Connecticut Department of Housing (DOH).
- (i) "Homeowner" means the owner(s) of the real property for which project is taking place and is a party to the contract.
- (j) "Project" means the entire project, whether construction or rehabilitation, the work for which is provided for in whole or in part under this contract.
- (k) "Specifications" means the written description of the technical requirements for construction and includes the criteria and tests for determining whether the requirements are met.
- (l) "Work" means materials, workmanship, and manufacture and fabrication of components.

2. Contractor's Responsibility for Work

- (a) The Contractor shall furnish all necessary labor, materials, tools, equipment, and transportation necessary for performance of the work. The Contractor shall also furnish all necessary water, heat, light, and power not made available to the Contractor by the Homeowner pursuant to the clause entitled Access to the Premises Section 5.3 of Homeowner Rehabilitation Agreement herein.
- (b) The Contractor shall perform on the site, and with its own organization, work equivalent to at least 15 percent of the total amount of work to be performed under the order. This percentage may be reduced by a supplemental agreement to this order if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of DOH.

- (c) At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the work site a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.
- (d) The Contractor shall be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence, and shall take proper safety and health precautions to protect the work, the workers, the public, and the property of others. The Contractor shall hold and save DOH, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.
- (e) The Contractor shall lay out the work from base lines and bench marks indicated on the drawings and be responsible for all lines, levels, and measurements of all work executed under the contract. The Contractor shall verify the figures before laying out the work and will be held responsible for any error resulting from its failure to do so.
- (f) The Contractor shall confine all operations (including storage of materials) on Homeowner premises to areas authorized or approved by the Contracting Officer.
- (g) The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. After completing the work and before final inspection, the Contractor shall (1) remove from the premises all scaffolding, equipment, tools, and materials (including rejected materials) that are not the property of the Homeowner and all rubbish caused by its work; (2) leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer; (3) perform all specified tests; and, (4) deliver the installation in complete and operating condition.
- (h) The Contractor's responsibility will terminate when all work has been completed, the final inspection made, and the work accepted by the Contracting Officer. The Contractor will then be released from further obligation except as required by the warranties specified elsewhere in the contract.

3. Architect's Duties, Responsibilities, and Authority

- (a) The Architect for this contract, and any successor, shall be designated in writing by the Contracting Officer.
- (b) The Architect shall serve as the Contracting Officer's technical representative with respect to architectural, engineering, and design matters related to the work performed under the contract. The Architect may provide direction on contract performance. Such direction shall be within the scope of the contract and may not be of a nature which: (1) institutes additional work outside the scope of the contract; (2) constitutes a change as defined in the Changes clause herein; (3) causes an increase or decrease in the cost of the contract; (4) alters the Construction Progress Schedule; or (5) changes any of the other express terms or conditions of the contract.
- (c) The Architect's duties and responsibilities may include but shall not be limited to:
 - (1) Making periodic visits to the work site, and on the basis of his/her on-site inspections, issuing written reports to DOH which shall include all observed deficiencies. The Architect shall file a copy of the report with the Contractor's designated representative at the site;
 - (2) Making modifications in drawings and technical specifications and assisting the Contracting Officer in the preparation of change orders and other contract modifications for issuance by the Contracting Officer;
 - (3) Reviewing and making recommendations with respect to - (i) the Contractor's construction progress schedules; (ii) the Contractor's shop and detailed drawings; (iii) the machinery, mechanical and other equipment and materials or other articles proposed for use by the Contractor; and, (iv) the Contractor's price breakdown and progress payment estimates; and,
 - (4) Assisting in inspections, signing Certificates of Completion, and making recommendations with respect to acceptance of work completed under the contract.

4. Other Contracts

DOH may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with DOH employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by DOH employees

5. Pre-construction Conference and Notice to Proceed

- (a) Upon scheduling of the contract execution, and prior to the commencement of work, the Contractor shall attend a preconstruction conference with representatives of DOH, its Architect, and other interested parties convened by DOH. The conference will serve to acquaint the participants with the general plan of the construction operation and all other requirements of the contract. DOH or its Architect will provide the Contractor with the date, time, and place of the conference.
- (b) The contractor shall begin work upon receipt of a written Notice to Proceed from the Contracting Officer or designee. The Contractor shall not begin work prior to receiving such notice. Such notice shall not be prior to the homeowners three (3) day Notice of Cancellation period.

6. Site Investigation and Conditions Affecting the Work

- (a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to, (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by DOH, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to DOH.
- (b) DOH assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by DOH. Nor does DOH assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in the contract.

7. Differing Site Conditions

- (a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of (1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or (2) unknown physical conditions at the site(s), of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.
- (b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. Work shall not proceed at the affected site, except at the Contractor's risk, until the Contracting Officer has provided written instructions to the Contractor. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work

under this contract, whether or not changed as a result of the conditions, the Contractor shall file a claim in writing to DOH within ten days after receipt of such instructions and, in any event, before proceeding with the work. An equitable adjustment in the contract price, the delivery schedule, or both shall be made under this clause and the contract modified in writing accordingly.

- (c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required; provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.
- (d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

8. Specifications and Drawings for Construction

- (a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.
- (b) Wherever in the specifications or upon the drawings the words “directed”, “required”, “ordered”, “designated”, “prescribed”, or words of like import are used, it shall be understood that the “direction”, “requirement”, “order”, “designation”, or “prescription”, of the Contracting Officer is intended and similarly the words “approved”, “acceptable”, “satisfactory”, or words of like import shall mean “approved by”, or “acceptable to”, or “satisfactory to” the Contracting Officer, unless otherwise expressly stated.
- (c) Where “as shown”, “as indicated”, “as detailed”, or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word “provided” as used herein shall be understood to mean “provide complete in place” that is “furnished and installed”.
- (d) “Shop drawings” means drawings, submitted to DOH by the Contractor, subcontractor, or any lower tier subcontractor, showing in detail (1) the proposed fabrication and assembly of structural elements and (2) the installation (i.e., form, fit, and attachment details) of materials of equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract. DOH may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.
- (e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with other contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor’s approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate DOH’s reasons therefore. Any work done before such approval shall be at the Contractor’s risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.
- (f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Architect approves any such variation and the Contracting Officer concurs, the Contracting Officer shall issue an appropriate modification to the contract, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.
- (g) It shall be the responsibility of the Contractor to make timely requests of DOH for such large scale and full size drawings, color schemes, and other additional information, not already in his possession, which

shall be required in the planning and production of the work. Such requests may be submitted as the need arises, but each such request shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay.

- (h) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by DOH and one set will be returned to the Contractor. As required by the Contracting Officer, the Contractor, upon completing the work under this contract, shall furnish a complete set of all shop drawings as finally approved. These drawings shall show all changes and revisions made up to the time the work is completed and accepted.
- (i) This clause shall be included in all subcontracts at any tier. It shall be the responsibility of the Contractor to ensure that all shop drawings prepared by subcontractors are submitted to the Contracting Officer.

9. Material and Workmanship

- (a) All equipment, material, and articles furnished under this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the contract to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of, and as approved by the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.
- (b) Approval of equipment and materials.
 - (1) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.
 - (2) When required by the specifications or the Contracting Officer, the Contractor shall submit appropriately marked samples (and certificates related to them) for approval at the Contractor's expense, with all shipping charges prepaid. The Contractor shall label, or otherwise properly mark on the container, the material or product represented, its place of origin, the name of the producer, the Contractor's name, and the identification of the construction project for which the material or product is intended to be used.
 - (3) Certificates shall be submitted in triplicate, describing each sample submitted for approval and certifying that the material, equipment or accessory complies with contract requirements. The certificates shall include the name and brand of the product, name of manufacturer, and the location where produced.
 - (4) Approval of a sample shall not constitute a waiver of DOH right to demand full compliance with contract requirements. Materials, equipment and accessories may be rejected for cause even though samples have been approved.
 - (5) Wherever materials are required to comply with recognized standards or specifications, such specifications shall be accepted as establishing the technical qualities and testing methods, but shall not govern the number of tests required to be made nor modify other contract requirements. The Contracting Officer may require laboratory test reports on items submitted for approval or may approve materials on the basis of data submitted in certificates with samples. Check tests will be made on materials delivered for use only as frequently as the Contracting Officer determines necessary to insure compliance of materials with the specifications. The Contractor will assume all costs of

retesting materials which fail to meet contract requirements and/or testing materials offered in substitution for those found deficient.

- (6) After approval, samples will be kept in the Project office until completion of work. They may be built into the work after a substantial quantity of the materials they represent has been built in and accepted.
- (c) Requirements concerning lead-based paint. The Contractor shall comply with the requirements concerning lead-based paint contained in the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821-4846) as implemented by 24 CFR Part 35, HUD's Lead Safe Housing Rule and EPA's Repair Renovation, and Painting Rule at 40 CFR.80 Subpart E.

10. Permits and Codes

The Contractor shall give all notices and comply with all applicable laws, ordinances, codes, rules and regulations. Notwithstanding the requirement of the Contractor to comply with the drawings and specifications in the contract, all work installed shall comply with all applicable codes and regulations as amended by any waivers. Before installing the work, the Contractor shall examine the drawings and the specifications for compliance with applicable codes and regulations bearing on the work and shall immediately report any discrepancy it may discover to the Contracting Officer. Where the requirements of the drawings and specifications fail to comply with the applicable code or regulation, the Contracting Officer shall modify the contract by change order pursuant to the clause entitled Changes herein to conform to the code or regulation.

- (a) The Contractor shall secure and pay for all permits, fees, and licenses necessary for the proper execution and completion of the work. Where DOH can arrange for the issuance of all or part of these permits, fees and licenses, without cost to the Contractor, the contract amount shall be reduced accordingly.

11. Health, Safety, and Accident Prevention

- (a) In performing this contract, the Contractor shall:
 - (1) Ensure that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his/her health and/or safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation;
 - (2) Protect the lives, health, and safety of other persons;
 - (3) Prevent damage to property, materials, supplies, and equipment; and,
 - (4) Avoid work interruptions.
- (b) For these purposes, the Contractor shall:
 - (1) Comply with regulations and standards issued by the Secretary of Labor at 29 CFR Part 1926. Failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat. 96), 40 U.S.C. 3701 et seq.; and
 - (2) Include the terms of this clause in every subcontract so that such terms will be binding on each subcontractor.
- (c) The Contractor shall maintain an accurate record of exposure data on all accidents incident to work performed under this contract resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment, and shall report this data in the manner prescribed by 29 CFR Part 1904.

- (d) The Contracting Officer shall notify the Contractor of any noncompliance with these requirements and of the corrective action required. This notice, when delivered to the Contractor or the Contractor's representative at the site of the work, shall be deemed sufficient notice of the noncompliance and corrective action required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to take corrective action promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not base any claim or request for equitable adjustment for additional time or money on any stop order issued under these circumstances.
- (e) The Contractor shall be responsible for its subcontractors' compliance with the provisions of this clause. The Contractor shall take such action with respect to any subcontract as DOH, the Secretary of Housing and Urban Development, or the Secretary of Labor shall direct as a means of enforcing such provisions.

12. Temporary Heating

The Contractor shall provide and pay for temporary heating, covering, and enclosures necessary to properly protect all work and materials against damage by dampness and cold, to dry out the work, and to facilitate the completion of the work. Any permanent heating equipment used shall be turned over to the Homeowner in the condition and at the time required by the specifications.

13. Availability and Use of Utility Services

- (a) The Homeowner shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The Contractor shall carefully conserve any utilities furnished without charge.
- (b) The Contractor, at its expense and in a manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines. Before final acceptance of the work by DOH, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

14. Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements

- (a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed under this contract, and which do not unreasonably interfere with the work required under this contract.
- (b) The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during performance of this contract, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.
- (c) The Contractor shall protect from damage all existing improvements and utilities (1) at or near the work site and (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. Prior to disturbing the ground at the construction site, the Contractor shall ensure that all underground utility lines are clearly marked.
- (d) The Contractor shall shore up, brace, underpin, secure, and protect as necessary all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be affected by the excavations or other operations connected with the construction of the project.
- (e) Any equipment temporarily removed as a result of work under this contract shall be protected, cleaned,

and replaced in the same condition as at the time of award of this contract.

- (f) New work which connects to existing work shall correspond in all respects with that to which it connects and/or be similar to existing work unless otherwise required by the specifications.
- (g) No structural members shall be altered or in any way weakened without the written authorization of the Contracting Officer, unless such work is clearly specified in the plans or specifications.
- (h) If the removal of the existing work exposes discolored or unfinished surfaces, or work out of alignment, such surfaces shall be refinished, or the material replaced as necessary to make the continuous work uniform and harmonious. This, however, shall not be construed to require the refinishing or reconstruction of dissimilar finishes previously exposed, or finished surfaces in good condition, but in different planes or on different levels when brought together by the removal of intervening work, unless such refinishing or reconstruction is specified in the plans or specifications.
- (i) The Contractor shall give all required notices to any adjoining or adjacent property owner or other party before the commencement of any work.
- (j) The Contractor shall indemnify and save harmless DOH from any damages on account of settlement or the loss of lateral support of adjoining property, any damages from changes in topography affecting drainage, and from all loss or expense and all damages for which DOH may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.
- (k) The Contractor shall repair any damage to vegetation, structures, equipment, utilities, or improvements, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

15. Temporary Buildings and Transportation of Materials

- (a) Temporary buildings (e.g., storage sheds, shops, offices, sanitary facilities) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to DOH. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- (b) The Contractor shall, as directed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any federal, state, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

16. Clean Air and Water

The contractor shall comply with the Clean Air Act, as amended, 42 USC 7401 et seq., the Federal Water Pollution Control Water Act, as amended, 33 U.S.C. 1251 et seq., and standards issued pursuant thereto in the facilities in which this contract is to be performed.

17. Energy Efficiency

The Contractor shall comply with mandatory standards and policies relating to energy efficiency which are contained in the energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub.L. 94-163) for the State in which the work under the contract is performed.

18. Green Building Standards

DOH will require that all replacement of residential properties, including reconstruction and new construction of substantially damaged properties meet the Enterprise Green Communities Standard.

For those buildings that are non-substantially damaged, DOH will require that they be rehabilitated following the HUD CPD Green Buildings Retrofit Checklist. The requirement for rehabilitation is that to the extent possible strive to meet the checklist standard where there are Energy Star, Water Sense and Federal Management Program-designed products available.

DOH strongly encourages the use of green infrastructure techniques to mitigate against storm water run-off and flooding and incorporate EPA's Green Infrastructure resources to the extent feasible.

19. Inspection and Acceptance of Construction

- (a) Definitions. As used in this clause -
 - (1) "Acceptance" means the act of an authorized representative of DOH by which DOH approves of the work performed under this contract. Acceptance may be partial or complete.
 - (2) "Inspection" means examining and testing the work performed under the contract (including, when appropriate, raw materials, equipment, components, and intermediate assemblies) to determine whether it conforms to contract requirements.
 - (3) "Testing" mean that element of inspection that determines the properties or elements, including functional operation of materials, equipment, or their components, by the application of established scientific principles and procedures.
- (b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. All work is subject to DOH inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.
- (c) DOH inspections and tests are for the sole benefit of DOH and do not: (1) relieve the Contractor of responsibility for providing adequate quality control measures; (2) relieve the Contractor of responsibility for loss or damage of the material before acceptance; (3) constitute or imply acceptance; or, (4) affect the continuing rights of DOH after acceptance of the completed work under paragraph (j) below.
- (d) The presence or absence of DOH inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specifications without the Contracting Officer's written authorization. All instructions and approvals with respect to the work shall be given to the Contractor by the Contracting Officer.
- (e) The Contractor shall promptly furnish, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. DOH may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. DOH shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.
- (f) DOH may conduct routine inspections of the construction site on a daily basis.
- (g) The Contractor shall, without charge, replace or correct work found by DOH not to conform to contract requirements, unless DOH decides that it is in its interest to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

- (h) If the Contractor does not promptly replace or correct rejected work, DOH may (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor, or (2) terminate for default the Contractor's right to proceed.
- (i) If any work requiring inspection is covered up without approval of DOH, it must, if requested by the Contracting Officer, be uncovered at the expense of the Contractor. If at any time before final acceptance of the entire work, DOH considers it necessary or advisable, to examine work already completed by removing or tearing it out, the Contractor, shall on request, promptly furnish all necessary facilities, labor, and material. If such work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray all the expenses of the examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the Contracting Officer shall make an equitable adjustment to cover the cost of the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.
- (j) The Contractor shall notify the Contracting Officer, in writing, as to the date when in its opinion all or a designated portion of the work will be substantially completed and ready for inspection. If the Architect determines that the state of preparedness is as represented, DOH will promptly arrange for the inspection. Unless otherwise specified in the contract, DOH shall accept, as soon as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines and designates can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or DOH's right under any warranty or guarantee.

20. Use and Possession Prior to Completion

- (a) If applicable, the Homeowner may have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the Homeowner intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The Homeowner's possession or use shall not be deemed an acceptance of any work under the contract.
- (b) While the Homeowner has such possession or use, the Contractor shall be relieved of the responsibility for (1) the loss of or damage to the work resulting from the Homeowner's possession or use, notwithstanding the terms of the clause entitled Permits and Codes herein; (2) all maintenance costs on the areas occupied; and, (3) furnishing heat, light, power, and water used in the areas occupied without proper remuneration therefore. If prior possession or use by the Homeowner delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

21. Warranty of Title

The Contractor warrants good title to all materials, supplies, and equipment incorporated in the work and agrees to deliver the premises together with all improvements thereon free from any claims, liens or charges, and agrees further that neither it nor any other person, firm or corporation shall have any right to a lien upon the premises or anything appurtenant thereto.

22. Warranty of Construction

- (a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (j) of this clause, that work performed under this contract conforms to the contract

requirements and is free of any defect in equipment, material, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. This warranty shall continue for a period of **one year** from the date of final acceptance of the work. If the Homeowner takes possession of any part of the work before final acceptance, this warranty shall continue for a period of (one year unless otherwise indicated) from the date that the Homeowner takes possession.

- (b) The Contractor shall remedy, at the Contractor's expense, any failure to conform, or any defect. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to Homeowner-owned or controlled real or personal property when the damage is the result of—
 - (1) The Contractor's failure to conform to contract requirements; or
 - (2) Any defects of equipment, material, workmanship or design furnished by the Contractor.
- (c) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for (one year unless otherwise indicated) from the date of repair or replacement.
- (d) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect or damage.
- (e) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, DOH shall have the right to replace, repair or otherwise remedy the failure, defect, or damage at the Contractor's expense.
- (f) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall:
 - (1) Obtain all warranties that would be given in normal commercial practice;
 - (2) Require all warranties to be executed in writing, for the benefit of the homeowner; and,
 - (3) Enforce all warranties for the benefit of the homeowner.
- (g) In the event the Contractor's warranty under paragraph(a) of this clause has expired, the homeowner may bring suit at its own expense to enforce a subcontractor's, manufacturer's or supplier's warranty.
- (h) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defect of material or design furnished by the homeowner nor for the repair of any damage that results from any defect in DOH furnished material or design.
- (i) Notwithstanding any provisions herein to the contrary, the establishment of the time periods in paragraphs (a) and (c) above relate only to the specific obligation of the Contractor to correct the work, and have no relationship to the time within which its obligation to comply with the contract may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to its obligation other than specifically to correct the work.
- (j) This warranty shall not limit DOH's/Homeowner's rights under the Inspection and Acceptance of Construction clause of this contract with respect to latent defects, gross mistakes or fraud.

23. Contract Period

The Contractor shall complete all work required under this contract within 120 calendar days of the effective date of the contract, or within the time schedule established in the notice to proceed issued by the Contracting Officer.

24. Order of Provisions

In the event of a conflict between these General Conditions and the Specifications, the General Conditions shall prevail. In the event of a conflict between the contract and any applicable state or local law or regulation, the state or local law or regulation shall prevail; provided that such state or local law or regulation does not conflict with, or is less restrictive than applicable federal law, regulation, or Executive Order. In the event of such a conflict, applicable federal law, regulation, and Executive Order shall prevail.

25. Payments

- (a) DOH/Homeowner shall pay the Contractor the price as provided in this contract.
- (b) DOH shall make progress payments approximately every 30 days as the work proceeds, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer. DOH may, subject to written determination and approval of the Contracting Officer, make more frequent payments to contractors which are qualified small businesses.
- (c) Before the first progress payment under this contract, the Contractor shall furnish, in such detail as requested by the Contracting Officer, a breakdown of the total contract price showing the amount included therein for each principal category of the work, which shall substantiate the payment amount requested in order to provide a basis for determining progress payments. The breakdown shall be approved by the Contracting Officer and must be acceptable to DOH. The values and quantities employed in making up this breakdown are for determining the amount of progress payments and shall not be construed as a basis for additions to or deductions from the contract price. The Contractor shall prorate its overhead and profit over the construction period of the contract.
- (d) The Contractor shall submit, on AIA forms provided by DOH, periodic estimates showing the value of the work performed during each period based upon the approved breakdown of the contract price. Such estimates shall be submitted not later than 14 days in advance of the date set for payment and are subject to correction and revision as required. The estimates must be approved by the Contracting Officer with the concurrence of the Architect prior to payment. If the contract covers more than one project, the Contractor shall furnish a separate progress payment estimate for each.
- (e) Along with each request for progress payments and the required estimates, the Contractor shall furnish lien waivers and labor releases as good and sufficient evidence that the premises are free from all liens, damages, and anything chargeable to said contractor.
- (f) Except as otherwise provided in State law, DOH shall retain five (5) percent of the amount of progress payments until completion and acceptance of all work under the contract; except, that if upon completion of 50 percent of the work, the Contracting Officer, after consulting with the Architect, determines that the Contractor's performance and progress are satisfactory, DOH may make the remaining payments in full for the work subsequently completed. If the Contracting Officer subsequently determines that the Contractor's performance and progress are unsatisfactory, DOH shall reinstate the five (5) percent retainage until such time as the Contracting Officer determines that performance and progress are satisfactory. Retainage will be released 90 days after project completion.
- (g) The Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration when computing progress payments. Material delivered to the Contractor at locations other than the site may also be taken into consideration if the Contractor furnishes satisfactory evidence that (1) it has acquired title to such material; (2) the material is properly stored in a bonded warehouse, storage yard, or similar suitable place as may be approved by the Contracting Officer; (3) the material is insured to cover its full value; and (4) the material will be used to perform this contract. Before any progress payment which includes delivered material is made, the Contractor shall furnish such documentation as the Contracting Officer may require to assure the protection of DOH's/Homeowner's interest in such materials. The Contractor shall remain responsible for such stored material notwithstanding the transfer of title to the Homeowner.
- (h) All material and work covered by progress payments made shall, at the time of payment become the sole property of the Homeowner, but this shall not be construed as (1) relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or, (2) waiving the right of DOH/Homeowner to require the fulfillment of all of the terms of the contract. In the event the work of the Contractor has been damaged by other contractors or persons other than employees of DOH in the course of their employment, the Contractor shall restore such damaged work without cost to DOH/Homeowner and to seek redress for its damage only from those who directly caused it.
- (i) DOH shall make the final payment due the Contractor under this contract after (1) completion and final

acceptance of all work; and (2) presentation of release of all claims against DOH/Homeowner arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. Each such exception shall embrace no more than one claim, the basis and scope of which shall be clearly defined. The amounts for such excepted claims shall not be included in the request for final payment. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned.

- (j) Prior to making any payment, the Contracting Officer may require the Contractor to furnish receipts or other evidence of payment from all persons performing work and supplying material to the Contractor, if the Contracting Officer determines such evidence is necessary to substantiate claimed costs.
- (k) DOH shall not; (1) determine or adjust any claims for payment or disputes arising there under between the Contractor and its subcontractors or material suppliers; or, (2) withhold any moneys for the protection of the subcontractors or material suppliers. The failure or refusal of DOH to withhold moneys from the Contractor shall in no wise impair the obligations of any surety or sureties under any bonds furnished under this contract.

26. Contract Modifications

- (a) Only the Contracting Officer has authority to modify any term or condition of this contract. Any contract modification shall be authorized in writing.
- (b) The Contracting Officer may modify the contract unilaterally (1) pursuant to a specific authorization stated in a contract clause (e.g., Changes); or (2) for administrative matters which do not change the rights or responsibilities of the parties (e.g., change in DOH/homeowner's address). All other contract modifications shall be in the form of supplemental agreements signed by the Contractor and the Contracting Officer.
- (c) When a proposed modification requires the approval of DOH prior to its issuance (e.g., a change order that exceeds DOH's approved threshold), such modification shall not be effective until the required approval is received by DOH.

27. Changes

- (a) The Contracting Officer may, at any time, without notice to the sureties, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract including changes:
 - (1) In the specifications (including drawings and designs);
 - (2) In the method or manner of performance of the work;
 - (3) Directing the acceleration in the performance of the work.
- (b) Any other written order or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating (1) the date, circumstances and source of the order and (2) that the Contractor regards the order as a change order.
- (c) Except as provided in this clause, no order, statement or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.
- (d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for a adjustment based on defective specifications, no proposal for any change under paragraph (b) above shall be allowed for any costs incurred more than 20 days (5 days for oral

orders) before the Contractor gives written notice as required. In the case of defective specifications for which DOH is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

- (e) The Contractor must assert its right to an adjustment under this clause within 30 days after (1) receipt of a written change order under paragraph (a) of this clause, or (2) the furnishing of a written notice under paragraph(b) of this clause, by submitting a written statement describing the general nature and the amount of the proposal. If the facts justify it, the Contracting Officer may extend the period for submission. The proposal may be included in the notice required under paragraph (b) above. No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.
- (f) The Contractor's written proposal for equitable adjustment shall be submitted in the form of a lump sum proposal supported with an itemized breakdown of all increases and decreases in the contract in at least the following details:
 - (1) Direct Costs. Materials (list individual items, the quantity and unit cost of each, and the aggregate cost); Transportation and delivery costs associated with materials; Labor breakdowns by hours or unit costs (identified with specific work to be performed); Construction equipment exclusively necessary for the change; Costs of preparation and/ or revision to shop drawings resulting from the change; Worker's Compensation and Public Liability Insurance; Employment taxes under FICA and FUTA; and, Bond Costs when size of change warrants revision.
 - (2) Indirect Costs. Indirect costs may include overhead, general and administrative expenses, and fringe benefits not normally treated as direct costs.
 - (3) Profit. The amount of profit shall be negotiated and may vary according to the nature, extent, and complexity of the work required by the change.

The allowability of the direct and indirect costs shall be determined in accordance with the Contract Cost Principles and Procedures for Commercial Firms in Part 31 of the Federal Acquisition Regulation (48 CFR 1-31), as implemented by HUD Handbook 2210.18, in effect on the date of this contract. The Contractor shall not be allowed a profit on the profit received by any subcontractor. Equitable adjustments for deleted work shall include a credit for profit and may include a credit for indirect costs. On proposals covering both increases and decreases in the amount of the contract, the application of indirect costs and profit shall be on the net- change in direct costs for the Contractor or subcontractor performing the work

- (g) The Contractor shall include in the proposal its request for time extension (if any), and shall include sufficient information and dates to demonstrate whether and to what extent the change will delay the completion of the contract in its entirety.
- (h) The Contracting Officer shall act on proposals within 30 days after their receipt, or notify the Contractor of the date when such action will be taken.
- (i) Failure to reach an agreement on any proposal shall be a dispute under the clause entitled Disputes herein. Nothing in this clause, however, shall excuse the Contractor from proceeding with the contract as changed.
- (j) Except in an emergency endangering life or property, no change shall be made by the Contractor without a prior order from the Contracting Officer.

28. Suspension of Work

- (a) The Contracting Officer may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of DOH/Homeowner.

If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified (or within a reasonable time if not specified) in this contract an adjustment may be made for any increase in the cost of performance of the contract

(excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor or for which any equitable adjustment is provided for or excluded under any other provision of this contract.

(b) A claim under this clause shall not be allowed without prior written approval of the Contracting Officer.

29. Disputes

- (a) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to the contract. A claim arising under the contract, unlike a claim relating to the contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim. The submission may be converted to a claim by complying with the requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.
- (b) Except for disputes arising under the clauses entitled Labor Standards - Davis Bacon and Related Acts, herein, all disputes arising under or relating to this contract, including any claims for damages for the alleged breach thereof which are not disposed of by agreement, shall be resolved under this clause.
- (c) All claims by the Contractor shall be made in writing and submitted to the Contracting Officer for a written decision.
- (d) A claim by the Homeowner against the Contractor shall be subject to a written decision by the Contracting Officer.
- (e) The Contracting Officer shall, within 60 (unless otherwise indicated) days after receipt of the request, decide the claim or notify the Contractor of the date by which the decision will be made.
- (f) The Contracting Officer's decision shall be final unless the Contractor (1) appeals in writing to a higher level in DOH in accordance with DOH's policy and procedures, (2) refers the appeal to an independent mediator or arbitrator, or (3) files suit in a court of competent jurisdiction. Such appeal must be made within (30 unless otherwise indicated) days after receipt of the Contracting Officer's decision.
- (g) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under or relating to the contract, and comply with any decision of the Contracting Officer.

30. Default

- (a) If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with the diligence that will insure its completion within the time specified in this contract, or any extension thereof, or fails to complete said work within this time, the Contracting Officer may, by written notice to the Contractor, terminate the right to proceed with the work (or separable part of the work) that has been delayed. In this event, DOH may take over the work and complete it, by contract or otherwise, and may take possession of and use any materials, equipment, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to DOH/Homeowner resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by DOH/Homeowner in completing the work.
- (b) The Contractor's right to proceed shall not be terminated or the Contractor charged with damages under this clause if—
 - (1) The delay in completing the work arises from unforeseeable causes beyond the control and without

the fault or negligence of the Contractor. Examples of such causes include (i) acts of God, or of the public enemy, (ii) acts of DOH or other governmental entity in either its sovereign or contractual capacity, (iii) acts of another contractor in the performance of a contract with DOH, (iv) fires, (v) floods, (vi) epidemics, (vii) quarantine restrictions, (viii) strikes, (ix) freight embargoes, (x) unusually severe weather, or (xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

(2) The Contractor, within days (5 days unless otherwise indicated) from the beginning of such delay (unless extended by the Contracting Officer) notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of the delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, time for completing the work shall be extended by written modification to the contract. The findings of the Contracting Officer shall be reduced to a written decision which shall be subject to the provisions of the Disputes clause of this contract

(c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been for convenience of DOH.

31. Liquidated Damages

(a) If the Contractor fails to complete the work within the time specified in the contract, or any extension, as specified in the clause entitled Default of this contract, the Contractor may pay to DOH as liquidated damages, the sum of \$100.00 for each day of delay. If different completion dates are specified in the contract for separate parts or stages of the work, the amount of liquidated damages shall be assessed on those parts or stages which are delayed. To the extent that the Contractor's delay or nonperformance is excused under another clause in this contract, liquidated damages shall not be due DOH. The Contractor remains liable for damages caused other than by delay.

(b) If DOH terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned DOH in completing the work.

(c) If DOH does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

32. Termination for Convenience

(a) The Contracting Officer may terminate this contract in whole, or in part, whenever the Contracting Officer determines that such termination is in the best interest of DOH/Homeowner. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which the performance of the work under the contract is terminated, and the date upon which such termination becomes effective.

(b) If the performance of the work is terminated, either in whole or in part, DOH/Homeowner shall be liable to the Contractor for reasonable and proper costs resulting from such termination upon the receipt by DOH of a properly presented claim setting out in detail: (1) the total cost of the work performed to date of termination less the total amount of contract payments made to the Contractor; (2) the cost (including reasonable profit) of settling and paying claims under subcontracts and material orders for work performed and materials and supplies delivered to the site, payment for which has not been made by DOH to the Contractor or by the Contractor to the subcontractor or supplier; (3) the cost of preserving and protecting the work already performed until DOH or assignee takes possession thereof or assumes responsibility therefore; (4) the actual or estimated cost of legal and accounting services reasonably necessary to prepare and present the termination claim to DOH/Homeowner; and (5) an amount constituting a reasonable profit on the value of the work performed by the Contractor.

(c) The Contracting Officer will act on the Contractor's claim within days (60 days unless otherwise

indicated) of receipt of the Contractor's claim.

- (d) Any disputes with regard to this clause are expressly made subject to the provisions of the Disputes clause of this contract.

33. Assignment of Contract

The Contractor shall not assign or transfer any interest in this contract; except that claims for monies due or to become due from DOH/Homeowner under the contract may be assigned to a bank, trust company, or other financial institution. Such assignments of claims shall only be made with the written concurrence of the Contracting Officer. If the Contractor is a partnership, this contract shall inure to the benefit of the surviving or remaining member(s) of such partnership as approved by the Contracting Officer.

34. Insurance

- (a) Before commencing work, the Contractor and each subcontractor shall furnish DOH with certificates of insurance listing DOH and the Homeowner as additionally insured A.T.I.M.A. showing the following insurance is in force and will insure all operations under the Contract:
 - (1) Workers' Compensation, in accordance with state or Territorial Workers' Compensation laws.
 - (2) Commercial General Liability with a combined single limit for bodily injury and property damage of not less than \$1,000,000 per occurrence to protect the Contractor and each subcontractor against claims for bodily injury or death and damage to the property of others. This shall cover the use of all equipment, hoists, and vehicles on the site(s) not covered by Automobile Liability under (3) below. If the Contractor has a "claims-made" policy, then the following additional requirements apply: the policy must provide a "retroactive date" which must be on or before the execution date of the Contract; and the extended reporting period may not be less than five years following the completion date of the Contract.
 - (3) Automobile Liability on owned and non-owned motor vehicles used on the site(s) or in connection therewith for a combined single limit for bodily injury and property damage of not less than \$1,000,000 per occurrence.
 - (4) Cargo Insurance in the amount of \$250,000 is required when the project involves raising the structure above the Base Flood Elevation.
- (b) Before commencing work, the Contractor shall furnish DOH with a certificate of insurance evidencing that Builder's Risk (fire and extended coverage) Insurance on all work in place and/or materials stored at the building site(s), including foundations and building equipment, is in force. The Builder's Risk Insurance shall be for the benefit of the Contractor, the Homeowner and DOH as their interests may appear and each shall be named in the policy or policies as an insured. The Contractor in installing equipment supplied by DOH shall carry insurance on such equipment from the time the Contractor takes possession thereof until the Contract work is accepted by DOH. The Builder's Risk Insurance need not be carried on excavations, piers, footings, or foundations until such time as work on the superstructure is started. It need not be carried on landscape work. Policies shall furnish coverage at all times for the full cash value of all completed construction, as well as materials in place and/or stored at the site(s), whether or not partial payment has been made by DOH. The Contractor may terminate this insurance on buildings as of the date taken over for occupancy by the Homeowner. The Contractor is not required to carry Builder's Risk Insurance for modernization work which does not involve structural alterations or additions and where the Homeowner's existing fire and extended coverage policy can be endorsed to include such work.
- (c) All insurance shall be carried with companies which are financially responsible and admitted to do business in the State in which the project is located with a minimum Best rating of A-. If any such insurance is due to expire during the construction period, the Contractor (including subcontractors, as applicable) shall not permit the coverage to lapse and shall furnish evidence of coverage to the

Contracting Officer. All certificates of insurance, as evidence of coverage, shall provide that no coverage may be canceled or non-renewed by the insurance company until at least 30 days prior written notice has been given to the Contracting Officer.

35. Subcontracts

- (a) Definitions. As used in this contract -
 - (1) "Subcontract" means any contract, purchase order, or other purchase agreement, including modifications and change orders to the foregoing, entered into by a subcontractor to furnish supplies, materials, equipment, and services for the performance of the prime contract or a subcontract.
 - (2) "Subcontractor" means any supplier, vendor, or firm that furnishes supplies, materials, equipment, or services to or for the Contractor or another subcontractor.
- (b) The Contractor shall not enter into any subcontract with any subcontractor who has been temporarily denied participation in a HUD program or who has been suspended or debarred from participating in contracting programs by any agency of the United States Government or of the state in which the work under this contract is to be performed.
- (c) The Contractor shall be as fully responsible for the acts or omissions of its subcontractors, and of persons either directly or indirectly employed by them as for the acts or omissions of persons directly employed by the Contractor.
- (d) The Contractor shall insert appropriate clauses in all subcontracts to bind subcontractors to the terms and conditions of this contract insofar as they are applicable to the work of subcontractors.
- (e) Nothing contained in this contract shall create any contractual relationship between any subcontractor and DOH or between the subcontractor and HUD.

36. Subcontracting with Small and Minority Firms, Women's Business Enterprise, and Labor Surplus Area Firms

The Contractor shall take the following steps to ensure that, whenever possible, subcontracts are awarded to small business firms, minority firms, women's business enterprises, and labor surplus area firms:

- (a) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
- (b) Ensuring that small and minority businesses and women's business enterprises are solicited whenever they are potential sources;
- (c) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses and women's business enterprises;
- (d) Establishing delivery schedules, where the requirements of the contract permit, which encourage participation by small and minority businesses and women's business enterprises; and
- (e) Using the services and assistance of the U.S. Small Business Administration, the Minority Business Development Agency of the U.S. Department of Commerce, and State and local governmental small business agencies.

37. Equal Employment Opportunity

During the performance of this contract, the Contractor agrees as follows:

- (a) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, or handicap.
- (b) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, national origin, or

handicap. Such action shall include, but not be limited to, (1) employment, (2) upgrading, (3) demotion, (4) transfer, (5) recruitment or recruitment advertising, (6) layoff or termination, (7) rates of pay or other forms of compensation, and (8) selection for training, including apprenticeship.

- (c) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.
- (d) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, or handicap.
- (e) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.
- (f) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.
- (g) The Contractor shall furnish all information and reports required by Executive Order 11246, as amended, Section 503 of the Rehabilitation Act of 1973, as amended, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto. The Contractor shall permit access to its books, records, and accounts by the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (h) In the event of a determination that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part, and the Contractor may be declared ineligible for further Government contracts, or Federally assisted construction contracts under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended, the rules, regulations, and orders of the Secretary of Labor, or as otherwise provided by law.
- (i) The Contractor shall include the terms and conditions of this clause in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor. The Contractor shall take such action with respect to any subcontract or purchase order as the Secretary of Housing and Urban Development or the Secretary of Labor may direct as a means of enforcing such provisions, including sanctions for noncompliance; provided that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.
- (j) Compliance with the requirements of this clause shall be to the maximum extent consistent with, but not in derogation of, compliance with section 7(b) of the Indian Self-Determination and Education Assistance Act and the Indian Preference clause of this contract.

38. Employment, Training, and Contracting Opportunities for Low-Income Persons, Section 3 of the Housing and Urban Development Act of 1968.

- (a) The work to be performed under this contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (Section 3). The purpose of Section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by Section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- (b) The parties to this contract agree to comply with HUD's regulations in 24 CFR Part 135, which implement Section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the Part 135 regulations.
- (c) The contractor agrees to send to each labor organization or representative of workers with which the

contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this Section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the Section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.

- (d) The contractor agrees to include this Section 3 clause in every subcontract subject to compliance with regulations in 24 CFR Part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this Section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR Part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR Part 135.
- (e) The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR Part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR Part 135.
- (f) Noncompliance with HUD's regulations in 24 CFR Part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
- (g) With respect to work performed in connection with Section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of Section 3 and Section 7(b) agree to comply with Section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

39. Interest of Members of Congress

No member of or delegate to the Congress of the United States of America shall be admitted to any share or part of this contract or to any benefit that may arise therefrom.

40. Interest of Members, Officers, or Employees and Former Members, Officers, or Employees

No member, officer, or employee of DOH, no member of the governing body of the locality in which the project is situated, no member of the governing body of the locality in which DOH was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the project, shall, during his or her tenure, or for one year thereafter, have any interest, direct or indirect, in this contract or the proceeds thereof.

41. Limitations on Payments made to Influence Certain Federal Financial Transactions

- (a) The Contractor agrees to comply with Section 1352 of Title 31, United States Code which prohibits the use of Federal appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.
- (b) The Contractor further agrees to comply with the requirement of the Act to furnish a disclosure (OMB Standard Form LLL, Disclosure of Lobbying Activities) if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be

paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

42. Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringement of any patent rights and shall save DOH/Homeowner harmless from loss on account thereof; except that DOH shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified and the Contractor has no reason to believe that the specified design, process, or product is an infringement. If, however, the Contractor has reason to believe that any design, process or product specified is an infringement of a patent, the Contractor shall promptly notify the Contracting Officer. Failure to give such notice shall make the Contractor responsible for resultant loss.

43. Examination and Retention of Contractor's Records

- (a) DOH, HUD, or Comptroller General of the United States, or any of their duly authorized representatives shall, until 3 years after final payment under this contract, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audit, examination, excerpts, and transcriptions.
- (b) The Contractor agrees to include in first-tier subcontracts under this contract a clause substantially the same as paragraph (a) above. "Subcontract," as used in this clause, excludes purchase orders not exceeding \$10,000.
- (c) The periods of access and examination in paragraphs (a) and (b) above for records relating to (1) appeals under the Disputes clause of this contract, (2) litigation or settlement of claims arising from the performance of this contract, or (3) costs and expenses of this contract to which DOH, HUD, or Comptroller General or any of their duly authorized representatives has taken exception shall continue until disposition of such appeals, litigation, claims, or exceptions.

44. Labor Standards - Davis-Bacon and Related Acts

Except for housing rehabilitation/reconstruction projects designed to contain fewer than eight (8) units, if the total amount of this contract exceeds \$2,000, the Federal labor standards set forth in the clause below shall apply to the development or construction work to be performed under the contract.

(a) Minimum Wages.

- (1) All laborers and mechanics employed under this contract in the development or construction of the project(s) involved will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof (if applicable), regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the regular weekly period, are deemed to be constructively made or incurred during such weekly period. If applicable, such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR

5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers (if applicable).

- (2) (i) Any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met: (A) The work to be performed by the classification requested is not performed by a classification in the wage determination; and (B) The classification is utilized in the area by the construction industry; and (C) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
 - (ii) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employee Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.
 - (iii) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.
 - (iv) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (a)(2)(ii) or (iii) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in classification.
 - (3) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
 - (4) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.
- (b) Withholding of funds. HUD or its designee shall, upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working in the construction or development of the project, all or part of the wages required by the contract, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee

may, after written notice to the Contractor, disburse such amounts withheld for and on account of the Contractor or subcontractor to the respective employees to whom they are due.

(c) Payrolls and basic records.

(1) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working in the construction or development of the project. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under 29 CFR 5.5(a)(1)(iv), that the wages of any laborer or mechanic include the amount of costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(2)

(i) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Contracting Officer for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under subparagraph (c)(1) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The Contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1214-0149.)

(ii) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

- a. That the payroll for the payroll period contains the information required to be maintained under paragraph (c) (1) of this clause and that such information is correct and complete;
- b. That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3; and
- c. That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(iii) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirements for submission of the "Statement of Compliance" required by subparagraph (c)(2)(ii) of this clause.

(iv) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.

(3) The Contractor or subcontractor shall make the records required under subparagraph (c)(1) available for inspection, copying, or transcription by authorized representatives of HUD or its designee, the Contracting Officer, or the Department of Labor and shall permit such representatives to interview

employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

- (d) (1) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship and Training, Employer and Labor Services (OATELS), or with a State Apprenticeship Agency recognized by OATELS, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by OATELS or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator of the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event OATELS, or a State Apprenticeship Agency recognized by OATELS, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (2) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program,

- the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (3) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.
 - (e) Compliance with Copeland Act requirements. The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.
 - (f) Contract termination; debarment. A breach of this contract clause may be grounds for termination of the contract and for debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.
 - (g) Compliance with Davis-Bacon and related Act requirements. All rulings and interpretations of the Davis-Bacon and related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.
 - (h) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this clause shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and DOH, HUD, the U.S. Department of Labor, or the employees or their representatives.
 - (i) Certification of eligibility.
 - (1) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - (2) No part of this contract shall be subcontracted to any person or firm ineligible for award of a United States Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - (3) The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C. 1001.
 - (j) Contract Work Hours and Safety Standards Act. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.
 - (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics, including watchmen and guards, shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.
 - (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the provisions set forth in subparagraph (j)(1) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic (including watchmen and guards) employed in violation of the provisions set forth in subparagraph (j)(1) of this clause, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by provisions set forth in subparagraph (j)(1) of this clause.
 - (3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the provisions set forth in subparagraph (j)(2) of this clause.
 - (k) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts all the provisions contained

in this clause, and such other clauses as HUD or its designee may by appropriate instructions require, and also a clause requiring the subcontractors to include these provisions in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all these provisions

45. . Non-Federal Prevailing Wage Rates

- (a) Any prevailing wage rate (including basic hourly rate and any fringe benefits), determined under State or tribal law to be prevailing, with respect to any employee in any trade or position employed under the contract, is inapplicable to the contract and shall not be enforced against the Contractor or any subcontractor, with respect to employees engaged under the contract whenever such non-Federal prevailing wage rate exceeds:
 - (1) The applicable wage rate determined by the Secretary of Labor pursuant to the Davis-Bacon Act (40 U.S.C. 3141 et seq.) to be prevailing in the locality with respect to such trade;
- (b) An applicable apprentice wage rate based thereon specified in an apprenticeship program registered with the U.S. Department of Labor (DOL) or a DOL- recognized State Apprenticeship Agency; or
- (c) An applicable trainee wage rate based thereon specified in a DOL-certified trainee program.

46. Procurement of Recovered Materials.

- (a) In accordance with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, the Contractor shall procure items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR Part 247 that contains the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition. The contractor shall procure items designated in the EPA guidelines that contain the highest percentage of recovered materials practicable unless the Contractor determines that such items: (1) are not reasonably available in a reasonable period of time; (2) fail to meet reasonable performance standards, which shall be determined on the basis of the guidelines of the National Institute of Standards and Technology, if applicable to the item; or (3) are only available at an unreasonable price.
- (b) Paragraph (a) of this clause shall apply to items purchased under this contract where: (1) the Contractor purchases in excess of \$10,000 of the item under this contract; or (2) during the preceding Federal fiscal year, the Contractor: (i) purchased any amount of the items for use under a contract that was funded with Federal appropriations and was within a Federal agency or a State agency of a political subdivision of a State; and (ii) purchased a total of in excess of \$10,000 of the item both under and outside that contract.

SECTION 000115

LIST OF DRAWING SHEETS

1.LIST OF DRAWINGS

- A. Drawings: Drawings consist of the Contract Drawings and other drawings listed on the Table of Contents page of the separately bound drawing set titled 'Project 1111 – 91 Dogwood Drive, Connecticut Department of Housing, Community Development Block Grant, Disaster Recovery Program , Owner Occupied Rehabilitation and Rebuilding Program, dated 7/1/2014, as modified by subsequent Addenda and Contract modifications.
- B. List of Drawings: Drawings consist of the following Contract Drawings and other drawings of type indicated:
1. Title Sheet – Sheet T0.00
 2. Schematic – Basement Layout, Sheet A1.01
 3. Schematic – First Floor Layout, Sheet, A1.02
 4. Electrical Symbols, Schedules, Notes & Details, Sheet E0.01
 5. Electrical Basement Floor Plan, Sheet E1.01
 6. Electrical First Floor Plan, Sheet E1.02
 7. Mechanical & Plumbing Symbols, Schedules, Notes & Details, Sheet, MP0.01
 8. Mechanical & Plumbing Basement Floor Plan, Sheet, MP1.01
 9. Mechanical & Plumbing First Floor Plan, Sheet, MP1.02

END OF SECTION

The State of Connecticut Department of Housing
Community Development Block Grant
Disaster Recovery Program (CDBG-DR)
Owner Occupied Rehabilitation and Rebuilding Program

Bid Documents
Project# 1111
91 Dogwood Drive
Easton, CT

SECTION 00 31 26

EXISTING HAZARDOUS MATERIAL INFORMATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. "Hazardous Material Inspection Report, 91 Dogwood Drive, Easton, CT" May 28, 2014

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION



Facility Support Services, LLC

Environmental & Safety Consulting Engineers

Connecticut Department of Housing Community Development Block Grant – Disaster Recovery Owner Occupied Recovery and Rehabilitation Program

Hazardous Materials Inspection Report

**91 Dogwood Road
Easton, Connecticut**

PREPARED FOR:

Martinez Couch & Associates, LLC
1084 Cromwell Ave. Suite A-2
Rocky Hill, CT 06067

PREPARED BY:

Facility Support Services, LLC
2685 State Street
Hamden, CT 06517
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May 5, 2014

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SIGNATURES OF REPORT AUTHORS

The employees of Facility Support Services, LLC whose names appear below prepared this report. Requests for information on the content of this document should be directed to these individuals.



Kevin S. Bogue, CHMM
Project Manager
CTDPH Asbestos Inspector #000157

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Table 2	Summary of PCB Testing Results
Table 3	Summary of Mold Testing Results

ATTACHMENTS

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Attachment B	Asbestos Laboratory Analytical Data
Attachment C	PCB Laboratory Analytical Data
Attachment D	Mold Analytical Data
Attachment E	Lead Analytical Data
Attachment F	Radon Analytical Data

I. Introduction

Facility Support Services, LLC (FSS) was contracted by Martinez, Couch & Associates, LLC (MCA) to perform a hazardous materials survey of 91 Dogwood Road, Easton, Connecticut. The purpose of this inspection was to identify the presence of asbestos, PCBs, lead paint and mold in certain building materials proposed for demolition that qualify for the repair/replacement of items damaged by the October 2012 Tropical Storm Sandy under the Connecticut Department of Housing (DOH), Community Development Block Grant – Disaster Recovery Owner Occupied Recovery and Rehabilitation Program.

In addition, FSS performed radon testing as required for DOH funded projects. FSS utilized best industry practices to identify all suspect materials associated with the structures. Any material that has not been identified during this inspection or discovered during renovation/demolition activities must be presumed to be hazardous until such time that samples of the material can be collected and analyzed.

II. Mold

FSS completed total spore air testing for the following areas of 91 Dogwood Road, Easton, Connecticut to identify concerns with indoor air quality related to mold and fungi:

- 1st Floor Mudroom
- Basement
- Outside ambient air
- One blank sample was collected for analysis for quality assurance/quality control purposes.

The outside ambient air sample provided a background reference sample (collected from a location in the front yard). Mr. Kevin Bogue of FSS conducted the spore sampling utilizing an air sampling pump and sample media. Air was collected at a rate of 15.0 liters of air per minute. The samples were collected on Air-O-Cell type

sampling cartridges located in line with the sampling pump, which ran for 10 minutes at each sampling location.

The spore samples were analyzed by EMSL Analytical of Wallingford, Connecticut for the identification and enumeration of spores (EMSL Method M001). EMSL is a State of Connecticut, Department of Public Health certified laboratory (Accreditation Number 165118). Analytical reports for mold are included in Appendix A.

The analysis for total spore counts is a direct microscopic examination and does not include culturing or growing fungi. Therefore, the results include both viable and non-viable spores. Spore trap results are reported in spores per cubic meter of air.

Table 1
Summary of Laboratory Analysis of Spore Types
91 Dogwood Road, Easton, Connecticut

Sample Number & Location	Raw Count	Total Fungi (Count/m ³)	Spore Types Present
24140409_M1 Basement	109	4,580	Ascospores, Aspergillus/Penicillium, Basidiospores, Cladosporium, Myxomycetes
24140409_M2 Mudroom	246	10,310	Ascospores, Aspergillus/Penicillium, Basidiospores, Chaetomium, Cladosporium, Ganoderma, Myxomycetes
24140409_M4 Outside	52	1,100	Alternaria, Ascospores, Aspergillus/Penicillium, Basidiospores, Cladosporium, Ganoderma, Myxomycetes, Pithomyces, Torula
24140409_M3 Blank	0	0	None

The primary mold species was Aspergillus/Penicillium, which can be associated with hay fever and asthma and grow on a wide range of substrates indoors, and are prevalent in water-damaged buildings and where foods are stored. In Connecticut, there are currently no regulatory standards directly governing mold/fungal spore concentrations. Although no standards for mold exist, some information regarding levels have been published, including the following:

Baxter, et al considers mold contamination present in a building when the total mold spore concentration per cubic meter is above 10,000. However in special cases, even low quantitative levels of certain particles or particle types (such as *Penicillium/Aspergillus* spore chains in an un-treated building) may be diagnostic and may indicate a hidden mold reservoir that merits further investigation.

FSS's investigation found total spore concentrations inside the Dogwood Road residence of up to 4,580/m³, below the 10,000/m³ level noted above.

At "high" levels most individuals with any sensitivity will experience symptoms. Acceptable levels for individual species have not been established since species toxicity varies widely as does spore size, weight, and other features that affect risk to building occupants. Previously published studies have found *Aspergillus/Penicillium* in a "clean" residential building was at a mean of 230; in buildings known to have a moisture or flooding problem it was at 2,235; and in mold contaminated buildings the figure was 36,037.

The American Conference of Government Industrial Hygienists (ACGIH) stated that indoor mold levels are generally less than 1/3 the outdoor level and that when indoor mold is at more than this level remedial action should be taken to find the source of the elevated counts and to clean it up. However, this is a general rule and may be inaccurate and unreliable method for screening buildings for mold.

FSS's investigation found total spore concentration in the interior samples of over 10 times the exterior sample, above the 1/3rd level noted above.

III. Radon

Radon testing was conducted by Mr. Kevin Bogue. Test results were obtained by using a passive activated charcoal device manufactured and analyzed by Radon Testing Corporation of America of Elmsford, New York. The test devices are individually numbered and marked with a bar code for identification (RTCA 4 Pass Charcoal Canister, NRSB Device Code 10331).

Devices were placed in two basement rooms of the residence on April 9, 2014. The sampling devices were placed on table with a yellow "Do Not Disturb Test in Progress" warning sign placed beneath the test device. The homeowner was reminded to not open windows or to allow anyone to tamper with the test device. Testing time for each location was approximately 168 hours. QA/QC consisted of the collection of a duplicate sample (from boiler room) and a blank.

The Radon canisters were submitted to Radon Testing Corporation of America for analysis. The analytical results for samples were reported at between 3.8 and 4.2 pCi/L, as shown on Table 2 below. The blank sample contained 0.1 pCi/L. Analytical result reports are included in Appendix B.

Table 2
Summary of Laboratory Analysis of Radon
91 Dogwood Road, Easton, Connecticut

Sample Number	Location	Radon Concentration (pCi/L)
2315134	Boiler Room	4.2
2315114	Boiler Room (Duplicate)	3.9
2315120	Basement Room	3.8
2315111	Blank	0.1

The primary Boiler Room sample (Sample #2315134) contained 4.2 pCi/L, above the 4.0 pCi/L action level established by the US EPA. The duplicate sample from this area (Sample #2315114), contained 3.9 pCi/L. The average for these two samples is 4.05 pCi/L. EPA radon protocols for sampling calls for re-testing when the average of the two samples are above 4.0 pCi/L. If the retest sample is found above 4.0 pCi/L, the EPA recommends that corrective measures be undertaken to reduce exposure to radon gas.

IV. Asbestos

Facility Support Services, LLC (FSS) conducted a limited scope asbestos inspection and bulk sampling on April 9, 2014 of suspect building materials that are proposed for renovations. The inspection was conducted by Kevin Bogue, a State of Connecticut licensed Asbestos Inspectors.

The following suspect materials were indentified during the inspection:

- 9"x9" Floor Tile (beige with black streaks)
- Black mastic associated with 9"x9" Floor Tile (beige with black streaks)
- 9"x9" Floor Tile (black with tan streaks)
- 1'x1' ceiling tiles

- Brown mastic associated with kitchen wall tiles
- Drip edge flashing along roof edge
- 9"x9" Floor Tile (red with colored specs)
- Black mastic associated with 9"x9" Floor Tile (red with colored specs)
- 9"x9" Floor Tile (white with colored specs)
- Paper backing to radiator units (white)
- Mastic/base (black, kitchen area)
- Boiler patch (white)
- Grey plaster base coat
- White plaster skim coat
- Ceiling panels in basement
- Linoleum mastic (yellow, in kitchen)

This asbestos inspection was performed in accordance with the EPA, NESHAP regulations for building renovations and demolition, 40 CFR Part 61, Amended 11/20/1990. The bulk asbestos samples collected during this inspection were delivered under full chain of custody and analyzed by EMSL Analytical, Inc., via EPA/600/R-93/116. This is currently the approved EPA test method, which uses Polarized Light Microscopy (PLM). EMSL Analytical, Inc. is an accredited asbestos laboratory (NVLAP # 200700-0) and is a State of Connecticut approved public health laboratory for asbestos analysis. Copies of the laboratory analytical results can be found in Attachment C of this report.

Laboratory results have revealed that the asbestos content of the following materials is greater than the 1% required to confirm a material as asbestos containing:

- (Mudroom) 9"x9" Floor Tile (beige with black streaks)
- (Mudroom) 9"x9" Floor Tile (black with tan streaks)
- (Mudroom) Black mastic associated with 9"x9" Floor Tiles
- (Kitchen) Brown mastic associated with wall tiles
- (Basement) 9"x9" Floor Tile (red with colored specs)
- (Basement) 9"x9" Floor Tile (white with colored specs)
- (Radiators) White paper backing

Refer to Table 3 below for a detailed description of each positive sample.

**Table 3
Positive Asbestos Bulk Sample Results**

Sample Number	Location of Sample	Material Sampled	% and Type of Asbestos
20140409_S1A	Mudroom	9"x9" Floor Tile (beige with black streaks)	3% Chrysotile
20140409_S1B	Mudroom	9"x9" Floor Tile (black with tan streaks)	5% Chrysotile
20140409_S1A	Mudroom	Black mastic associated with 9"x9" Floor Tiles	5% Chrysotile
20140409_S4A	Kitchen	Brown mastic associated with wall tiles	2% Chrysotile
20140409_S6A	Basement	9"x9" Floor Tile (red with colored specs)	5% Chrysotile
20140409_S7A	Basement	9"x9" Floor Tile (white with colored specs)	6% Chrysotile
20140409_S8A	Throughout	White paper backing	55% Chrysotile

V. PCBs

The following suspect materials were indentified during the inspection:

- Black mastic beneath basement 9"x9" floor tiles (sample 20140409_P1)
- Black base/mastic on kitchen floor (sample 20140409_P2)
- Black mastic beneath mudroom 9"x9" floor tiles (sample 20140409_P3)

The bulk PCB samples collected during this inspection were delivered under full chain of custody and analyzed by Complete Environmental Testing, Inc. (CET), via EPA Method 8082A with Soxhlet extraction (3540C). CET is a State of Connecticut approved department of public health laboratory (PH# 0116). Copies of the PCB laboratory analytical results can be found in Attachment D of this report.

Laboratory results revealed that the PCB content of the material sampled and analyzed was Not Detected and below the reporting limit of 0.80 mg/kg. Therefore the material is considered unregulated for disposal under EPA and State of Connecticut Department of Energy & Environmental Protection (CTDEEP) regulations.

VI. Lead

FSS conducted a sampling event for leachable lead for components proposed to be removed from the residence and disposed of in a landfill. Sampling was conducted by Kevin Bogue on April 16, 2014. Components included in the sampling event included building materials that are proposed for renovations, and that have not been identified as asbestos containing materials (abated prior to demolition).

The lead sample was delivered under full chain of custody and analyzed by CET Analytical Laboratory for lead via TCLP extraction (i.e., leachable lead) via EPA Method SW-846 7000 Series/SW-846 Method 1311. CET is an accredited laboratory (NELAP # PH0116).

The composite sample for leachable lead resulted in 0.037 mg/l, below the 5 mg/L level for hazardous materials. Therefore, the demolition debris can be disposed of as not containing hazardous levels of lead. Copies of the laboratory analytical result can be found in Attachment E of this report.

VII. Conclusions & Recommendations

When the structure is renovated, all removed debris should be sent to an appropriate landfill for final disposal following all appropriate regulations. All asbestos containing materials impacted by the project should first be removed by appropriately licensed/trained personnel following all applicable regulations. Any work involving lead-containing paints should be conducted under the EPA's RRP Renovation, Repair and Painting Rule. Any material discovered during renovation activities which have not been included in this survey must be presumed to contain asbestos, lead and PCBs until such time that the material can be evaluated and sampled.

Asbestos – Asbestos containing materials (>1% asbestos) were identified in floor tiles and associated mastic located in the mudroom and basement. In addition, the brown mastic used for the kitchen tiles, and the white paper backing behind the radiators were also identified as positive for asbestos. The ACMs identified in this report should be

avoided if possible during the project. If any of the ACMs identified will be impacted, a State of Connecticut licensed asbestos contractor must be utilized to remove and dispose of the ACMs following all applicable State and Federal Regulations prior to disturbance.

PCBs - No detectable levels of PCBs were found in sampled building materials. Materials proposed for renovation can be disposed of as non-PCB containing materials.

Mold – Mold spore count analysis indicates possible accelerated mold growth in the areas surveyed when comparing indoor mold spore count numbers to exterior spore count numbers. Following site renovations, another mold sample should be collected to evaluate impacts to mold levels in the residence pre and post abatement.

Radon – Levels of radon were identified in the basement of the residence at levels above 4.0 pCi/L. Following site renovations, another Radon sample should be collected to evaluate radon levels following renovations, where the site building will be an undisturbed state. EPA radon protocols for sampling calls for re-testing when the average of the two samples are above 4.0 pCi/L. If the retest sample is found above 4.0 pCi/L, the EPA recommends that corrective measures be undertaken to reduce exposure to radon gas.

ATTACHMENTS

ATTACHMENT A

FSS LICENSURE

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

PURSUANT TO THE PROVISIONS OF THE GENERAL STATUTES OF CONNECTICUT
THE INDIVIDUAL NAMED BELOW IS LICENSED
BY THIS DEPARTMENT AS A

ASBESTOS CONSULTANT - INSP/MGMT PLANNER

LICENSE NO
000157
CURRENT THROUGH
08/31/14
VALIDATION NO
03-628349

KEVIN S. BOGUE

Kevin Bogue
SIGNATURE

Joel Muller
COMMISSIONER

ATTACHMENT B
ASBESTOS LABORATORY ANALYTICAL DATA



EMSL Analytical, Inc.

29 North Plains Highway, Unit # 4, Wallingford, CT 06492
Phone/Fax: 203-284-5948 / (203) 284-5978
<http://www.EMSL.com> wallingfordlab@emsl.com

EMSL Order: 241401238
CustomerID: FSS93
CustomerPO:
ProjectID:

Attn: **Kevin Bogue**
Facility Support Services, LLC
2685 State Street

Hamden, CT 06517

Project: 22214

Phone: (203) 288-1281
Fax: (203) 248-4409
Received: 04/10/14 5:10 PM
Analysis Date: 4/15/2014
Collected: 4/9/2014

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
20140409-S1A-Floor Tile 241401238-0001	Mudroom - 9"x9" beige floor tile (w/black streaks) + black mastic	Tan Non-Fibrous Homogeneous	8% Wollastonite	30% Ca Carbonate 59% Non-fibrous (other)	3% Chrysotile
20140409-S1A-Mastic 241401238-0001A	Mudroom - 9"x9" beige floor tile (w/black streaks) + black mastic	Black Non-Fibrous Homogeneous		95% Non-fibrous (other)	5% Chrysotile
20140409-S1B-Floor Tile 241401238-0002	Mudroom - 9"x9" beige floor tile (w/black streaks) + black mastic				Stop Positive (Not Analyzed)
20140409-S1B-Mastic 241401238-0002A	Mudroom - 9"x9" beige floor tile (w/black streaks) + black mastic				Stop Positive (Not Analyzed)
20140409-S1C-Floor Tile 241401238-0003	Mudroom - 9"x9" beige floor tile (w/black streaks) + black mastic				Stop Positive (Not Analyzed)
20140409-S1C-Mastic 241401238-0003A	Mudroom - 9"x9" beige floor tile (w/black streaks) + black mastic				Stop Positive (Not Analyzed)
20140409-S2A 241401238-0004	Mudroom - 9"x9" black floor tile (w/tan streaks)	Black Non-Fibrous Homogeneous		30% Ca Carbonate 65% Non-fibrous (other)	5% Chrysotile

Analyst(s)
Kristin Lopez (9) William Shedrawy (19)
Renaldo Drakes (6)

Gloria V. Oriol, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%
Samples analyzed by EMSL Analytical, Inc. Wallingford, CT NVLAP Lab Code 200700-0.

Initial report from 04/15/2014 10:45:08



EMSL Analytical, Inc.

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<http://www.EMSL.com> wallingfordlab@emsl.com

EMSL Order: 241401238
CustomerID: FSS93
CustomerPO:
ProjectID:

Attn: **Kevin Bogue**
Facility Support Services, LLC
2685 State Street

Hamden, CT 06517

Project: 22214

Phone: (203) 288-1281
Fax: (203) 248-4409
Received: 04/10/14 5:10 PM
Analysis Date: 4/15/2014
Collected: 4/9/2014

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
20140409-S2B 241401238-0005	Mudroom - 9"x9' black floor tile (w/tan streaks)				Stop Positive (Not Analyzed)
20140409-S2C 241401238-0006	Mudroom - 9"x9' black floor tile (w/tan streaks)				Stop Positive (Not Analyzed)
20140409-S3A 241401238-0007	Mudroom - 1'x1' ceiling tile	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (other)	None Detected
20140409-S3B 241401238-0008	Mudroom - 1'x1' ceiling tile	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (other)	None Detected
20140409-S3C 241401238-0009	Mudroom - 1'x1' ceiling tile	Brown Fibrous Homogeneous	99% Cellulose	1% Non-fibrous (other)	None Detected
20140409-S4A 241401238-0010	Kitchen wall tiles - brown mastic	Tan Non-Fibrous Homogeneous		30% Ca Carbonate 68% Non-fibrous (other)	2% Chrysotile
20140409-S4B 241401238-0011	Kitchen wall tiles - brown mastic				Stop Positive (Not Analyzed)
20140409-S5A 241401238-0012	Roof - drip edge flashing	Black Fibrous Homogeneous	12% Glass	88% Non-fibrous (other)	None Detected
20140409-S5B 241401238-0013	Roof - drip edge flashing	Black Non-Fibrous Homogeneous	10% Glass <1% Cellulose	20% Ca Carbonate 70% Non-fibrous (other)	None Detected

Analyst(s)
Kristin Lopez (9) William Shedrawy (19)
Renaldo Drakes (6)


Gloria V. Oriol, Laboratory Manager
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Wallingford, CT NVLAP Lab Code 200700-0.

Initial report from 04/15/2014 10:45:08



EMSL Analytical, Inc.

29 North Plains Highway, Unit # 4, Wallingford, CT 06492
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<http://www.EMSL.com> wallingfordlab@emsl.com

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Hamden, CT 06517

Phone: (203) 288-1281
 Fax: (203) 248-4409
 Received: 04/10/14 5:10 PM
 Analysis Date: 4/15/2014
 Collected: 4/9/2014

Project: 22214

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos	
			% Fibrous	% Non-Fibrous	% Type	
20140409-S6A-Floor Tile <i>241401238-0014</i>	Basement - 9"x9" red floor tiles (w/colored spec) + black mastic	Red Non-Fibrous Homogeneous	<1% Cellulose	20% Ca Carbonate 75% Non-fibrous (other)	5% Chrysotile	
20140409-S6A-Mastic <i>241401238-0014A</i>	Basement - 9"x9" red floor tiles (w/colored spec) + black mastic	Black Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected	
20140409-S6B-Floor Tile <i>241401238-0015</i>	Basement - 9"x9" red floor tiles (w/colored spec) + black mastic				Stop Positive (Not Analyzed)	
20140409-S6B-Mastic <i>241401238-0015A</i>	Basement - 9"x9" red floor tiles (w/colored spec) + black mastic	Black Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected	
20140409-S6C-Floor Tile <i>241401238-0016</i>	Basement - 9"x9" red floor tiles (w/colored spec) + black mastic				Stop Positive (Not Analyzed)	
20140409-S6C-Mastic <i>241401238-0016A</i>	Basement - 9"x9" red floor tiles (w/colored spec) + black mastic	Black Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected	
20140409-S7A <i>241401238-0017</i>	Basement - 9"x9" white floor tiles (w/colored specs)	White Non-Fibrous Homogeneous	<1% Cellulose	20% Ca Carbonate 74% Non-fibrous (other)	6% Chrysotile	

Analyst(s)
 Kristin Lopez (9) William Shedrawy (19)
 Renaldo Drakes (6)


 Gloria V. Oriol, Laboratory Manager
 or other approved signatory

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 Samples analyzed by EMSL Analytical, Inc. Wallingford, CT NVLAP Lab Code 200700-0.

Initial report from 04/15/2014 10:45:08

**EMSL Analytical, Inc.**

29 North Plains Highway, Unit # 4, Wallingford, CT 06492

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<http://www.EMSL.com>wallingfordlab@emsl.com

EMSL Order:	241401238
CustomerID:	FSS93
CustomerPO:	
ProjectID:	

Attn: **Kevin Bogue**
Facility Support Services, LLC
2685 State Street

Hamden, CT 06517

Project: 22214

Phone: (203) 288-1281
 Fax: (203) 248-4409
 Received: 04/10/14 5:10 PM
 Analysis Date: 4/15/2014
 Collected: 4/9/2014

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
20140409-S7B 241401238-0018	Basement - 9"x9" white floor tiles (w/colored specs)				Stop Positive (Not Analyzed)
20140409-S8A 241401238-0019	Kitchen - white paper backing to radiator	White Fibrous Homogeneous	30% Cellulose	10% Ca Carbonate 5% Non-fibrous (other)	55% Chrysotile
20140409-S8B 241401238-0020	Kitchen - white paper backing to radiator				Stop Positive (Not Analyzed)
20140409-S9A 241401238-0021	Kitchen - black base/mastic	Black Fibrous Homogeneous	60% Cellulose 8% Synthetic	32% Non-fibrous (other)	None Detected
20140409-S9B 241401238-0022	Kitchen - black base/mastic	Black Fibrous Homogeneous	55% Cellulose 10% Synthetic	35% Non-fibrous (other)	None Detected
20140409-S10A 241401238-0023	Basement - white boiler patch	White Non-Fibrous Homogeneous	15% Wollastonite <1% Cellulose	35% Ca Carbonate 50% Non-fibrous (other)	None Detected
20140409-S10B 241401238-0024	Basement - white boiler patch	White Non-Fibrous Homogeneous	10% Wollastonite	30% Ca Carbonate 60% Non-fibrous (other)	None Detected
20140409-S11A 241401238-0025	1st floor - grey base coat	Gray Non-Fibrous Homogeneous	<1% Cellulose <1% Fibrous (other)	15% Quartz 25% Ca Carbonate 60% Non-fibrous (other)	None Detected

Analyst(s)

Kristin Lopez (9)
 Renaldo Drakes (6)

William Shedrawy (19)

Gloria V. Oriol, Laboratory Manager
 or other approved signatory

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Initial report from 04/15/2014 10:45:08



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EMSL Order: 241401238
CustomerID: FSS93
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Attn: **Kevin Bogue**
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2685 State Street

Hamden, CT 06517

Project: 22214

Phone: (203) 288-1281
Fax: (203) 248-4409
Received: 04/10/14 5:10 PM
Analysis Date: 4/15/2014
Collected: 4/9/2014

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
20140409-S11B 241401238-0026	1st floor - grey base coat	Gray Non-Fibrous Homogeneous	<1% Cellulose	10% Quartz 30% Ca Carbonate 60% Non-fibrous (other)	None Detected
20140409-S11C 241401238-0027	1st floor - grey base coat	Gray Non-Fibrous Homogeneous	<1% Cellulose <1% Fibrous (other)	15% Quartz 35% Ca Carbonate 50% Non-fibrous (other)	None Detected
20140409-S11D 241401238-0028	1st floor - grey base coat	Gray Non-Fibrous Homogeneous	<1% Cellulose	15% Quartz 30% Ca Carbonate 55% Non-fibrous (other)	None Detected
20140409-S11E 241401238-0029	1st floor - grey base coat	Gray Non-Fibrous Homogeneous	<1% Cellulose	20% Quartz 40% Ca Carbonate 40% Non-fibrous (other)	None Detected
20140409-S12A 241401238-0030	1st floor - white skim coat	White Non-Fibrous Homogeneous	<1% Cellulose	50% Ca Carbonate 50% Non-fibrous (other)	None Detected
20140409-S12B 241401238-0031	1st floor - white skim coat	White Non-Fibrous Homogeneous	<1% Cellulose	55% Ca Carbonate 45% Non-fibrous (other)	None Detected
20140409-S12C 241401238-0032	1st floor - white skim coat	White Non-Fibrous Homogeneous		55% Ca Carbonate 45% Non-fibrous (other)	None Detected

Analyst(s)
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Renaldo Drakes (6)


Gloria V. Oriol, Laboratory Manager
or other approved signatory

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Initial report from 04/15/2014 10:45:08



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Fax: (203) 248-4409
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Analysis Date: 4/15/2014
Collected: 4/9/2014

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
20140409-S12D 241401238-0033	1st floor - white skim coat	White Non-Fibrous Homogeneous	<1%	Cellulose	50% Ca Carbonate 50% Non-fibrous (other) None Detected
20140409-S12E 241401238-0034	1st floor - white skim coat	White Non-Fibrous Homogeneous	<1%	Cellulose	60% Ca Carbonate 40% Non-fibrous (other) None Detected
20140409-S13A 241401238-0035	Basement - ceiling panels	Brown Fibrous Homogeneous	95%	Cellulose	5% Non-fibrous (other) None Detected
20140409-S13B 241401238-0036	Basement - ceiling panels	Brown Fibrous Homogeneous	98%	Cellulose	2% Non-fibrous (other) None Detected
20140409-S13C 241401238-0037	Basement - ceiling panels	Brown Fibrous Homogeneous	99%	Cellulose	1% Non-fibrous (other) None Detected
20140409-S14A 241401238-0038	Kitchen - linoleum mastic- brown	Brown Non-Fibrous Homogeneous	3%	Cellulose	97% Non-fibrous (other) None Detected
20140409-S14B 241401238-0039	Kitchen - linoleum mastic- brown	Brown Non-Fibrous Homogeneous	5%	Cellulose	95% Non-fibrous (other) None Detected

Analyst(s)
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Samples analyzed by EMSL Analytical, Inc. Wallingford, CT NVLAP Lab Code 200700-0.

Initial report from 04/15/2014 10:45:08



EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Bulk Building Material Chain of Custody

EMSL Order Number (Lab Use Only):

241401239

EMSL Analytical, Inc.
29 North Plains Hwy
Unit 4
Wallingford, CT 06492
PHONE: (203) 284-5948
FAX: (203) 284-5978

Company : Facility Support Services, LLC		EMSL-Bill to: <input checked="" type="checkbox"/> Same <input type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 2685 State Street		Third Party Billing requires written authorization from third party	
City: Hamden	State/Province: CT	Zip/Postal Code: 06517	Country: United States
Report To (Name): Kevin Bogue		Telephone #: 203-288-1281	
Email Address: kbogue.fss@snet.net		Fax #:	Purchase Order:
Project Name/Number: 22214		Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email <input type="checkbox"/> Mail	
U.S. State Samples Taken: CT		CT Samples: <input type="checkbox"/> Commercial/Taxable <input checked="" type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

3 Hour 6 Hour 24 Hour 48 Hour 72 Hour 96 Hour 1 Week 2 Week

*For TEM Air 3 hr through 6 hr, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PLM - Bulk (reporting limit)		TEM - Bulk	
<input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%)	<input type="checkbox"/> PLM EPA NOB (<1%)	<input type="checkbox"/> TEM EPA NOB - EPA 600/R-93/116 Section 2.5.5.1	<input type="checkbox"/> NY ELAP Method 198.4 (TEM)
Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%)	Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%)	<input type="checkbox"/> Chatfield Protocol (semi-quantitative)	<input type="checkbox"/> TEM % by Mass - EPA 600/R-93/116 Section 2.5.5.2
<input type="checkbox"/> NIOSH 9002 (<1%)	<input type="checkbox"/> NY ELAP Method 198.1 (friable in NY)	<input type="checkbox"/> TEM Qualitative via Filtration Prep Technique	<input type="checkbox"/> TEM Qualitative via Drop Mount Prep Technique
<input type="checkbox"/> NY ELAP Method 198.6 NOB (non-friable-NY)	<input type="checkbox"/> OSHA ID-191 Modified	Other	
<input type="checkbox"/> Standard Addition Method		<input type="checkbox"/>	

Check For Positive Stop - Clearly Identify Homogenous Group Date Sampled: 4/9/14

Samplers Name: Kevin Bogue Samplers Signature: *Kevin Bogue*

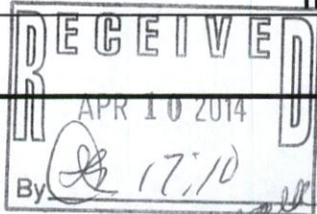
Sample #	HA #	Sample Location	Material Description
20140409-S1A	1+2	MudRoom	9'x9" Beige Floor Tile (w/ black streaks) + Black Mastic
S1B	1+2	↓	↓
S1C	1+2	↓	↓
20140409-S2A	3	MudRoom	9'x9" Black Floor Tile (w/ tan streaks)
S2B	3	↓	↓
S2C	3	↓	↓
20140409-S3A	4	MudRoom	1'x1' Ceiling tile
S3B	4	↓	↓
S3C	4	↓	↓

Client Sample # (s): S1A - S14B Total # of Samples: 39

Relinquished (Client): *Kevin Bogue* Date: Time:

Received (Lab): Date: Time:

Comments/Special Instructions:





EMSL ANALYTICAL, INC.
LABORATORY PRODUCTS TRAINING

Asbestos Bulk Building Material Chain of Custody

EMSL Order Number (Lab Use Only):

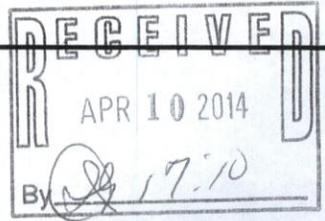
24140123-8

EMSL Analytical, Inc.
29 North Plains Hwy
Unit 4
Wallingford, CT 06492
PHONE: (203) 284-5948
FAX: (203) 284-5978

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	HA #	Sample Location	Material Description
20140409-54A	5	Kitchen wall tiles	Brown Mosaic
54B	5	↓	↓
20140409-55A	6	Roof	Drip edge flashing
55B	6	↓	↓
20140409-56A	7+8	Basement	9'x9" Red Floor tiles (w/colored speck) + black grout
56B	7+8	↓	↓
56C	7+8	↓	↓
20140409-57A	9	Basement	9'x9" white Floor Tiles (w/colored speck)
57B	9	↓	↓
20140409-58A	10	Kitchen	white paper backing to Radiant
58B	10	↓	↓
20140409-59A	11	Kitchen	black base/mosaic
59B	11	↓	↓
20140409-50A	12	Basement	white boiler patch
50B	12	↓	↓
20140409-51A	13	grey base coat	1 st Floor
51B	13	↓	↓
51C	13	↓	↓
51D	13	↓	↓
51E	13	↓	↓

*Comments/Special Instructions:



ATTACHMENT C
PCB LABORATORY ANALYTICAL DATA

80 Lupes Drive
Stratford, CT 06615



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Fax: (203) 377-9952
e-mail: cet1@cetlabs.com

Client: Mr. Kevin Bogue
Facility Support Services
2685 State Street
Hamden, CT 06517

Analytical Report

CET# 4040289

Report Date: April 18, 2014
Project: MCA, Easton
Project Number: 22214

Connecticut Laboratory Certificate: PH 0116
Massachusetts laboratory Certificate.: M-CT903
Rhode Island Certification: 199



New York Certification: 11982
Florida Laboratory Certification: E871064

CET #:4040289
 Project: MCA, Easton
 Project Number: 22214

SAMPLE SUMMARY

The sample(s) were received at 5.0°C.

This report contains analytical data associated with following samples only.

Sample ID	Laboratory ID	Matrix	Collection Date/Time	Receipt Date
20140409_P1	4040289-01	Solid	4/09/2014	04/11/2014
20140409_P2	4040289-02	Solid	4/09/2014	04/11/2014
20140409_P3	4040289-03	Solid	4/09/2014	04/11/2014

Client Sample ID 20140409_P1
Lab ID: 4040289-01

PCBs by Soxhlet
Method: EPA 8082A

Analyst: CA
Matrix: Solid

Analyte	Result (mg/kg (As Rec))	RL (mg/kg (As Rec))	Dilution	Prep Method	Batch	Prepared	Date/Time Analyzed	Notes
PCB-1016	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 12:50	
PCB-1221	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 12:50	
PCB-1232	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 12:50	
PCB-1242	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 12:50	
PCB-1248	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 12:50	
PCB-1254	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 12:50	
PCB-1260	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 12:50	
PCB-1268	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 12:50	
PCB-1262	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 12:50	
<i>Surrogate: TCMX</i>	86.2 %	50 - 150			B4D1415	04/14/2014	04/17/2014 12:50	
<i>Surrogate: DCB</i>	88.3 %	50 - 150			B4D1415	04/14/2014	04/17/2014 12:50	

CET #:4040289
 Project: MCA, Easton
 Project Number: 22214

Client Sample ID 20140409_P2
Lab ID: 4040289-02

PCBs by Soxhlet
Method: EPA 8082A

Analyst: CA
Matrix: Solid

Analyte	Result (mg/kg (As Rec))	RL (mg/kg (As Rec))	Dilution	Prep Method	Batch	Prepared	Date/Time Analyzed	Notes
PCB-1016	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:08	
PCB-1221	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:08	
PCB-1232	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:08	
PCB-1242	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:08	
PCB-1248	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:08	
PCB-1254	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:08	
PCB-1260	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:08	
PCB-1268	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:08	
PCB-1262	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:08	
<i>Surrogate: TCMX</i>	<i>85.5 %</i>	<i>50 - 150</i>			B4D1415	04/14/2014	<i>04/17/2014 13:08</i>	
<i>Surrogate: DCB</i>	<i>118 %</i>	<i>50 - 150</i>			B4D1415	04/14/2014	<i>04/17/2014 13:08</i>	

CET #:4040289
 Project: MCA, Easton
 Project Number: 22214

Client Sample ID 20140409_P3
Lab ID: 4040289-03

PCBs by Soxhlet
Method: EPA 8082A

Analyst: CA
Matrix: Solid

Analyte	Result (mg/kg (As Rec))	RL (mg/kg (As Rec))	Dilution	Prep Method	Batch	Prepared	Date/Time Analyzed	Notes
PCB-1016	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:27	
PCB-1221	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:27	
PCB-1232	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:27	
PCB-1242	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:27	
PCB-1248	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:27	
PCB-1254	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:27	
PCB-1260	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:27	
PCB-1268	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:27	
PCB-1262	ND	0.80	4	EPA 3540C	B4D1415	04/14/2014	04/17/2014 13:27	
<i>Surrogate: TCMX</i>	<i>76.2 %</i>	<i>50 - 150</i>			B4D1415	04/14/2014	<i>04/17/2014 13:27</i>	
<i>Surrogate: DCB</i>	<i>91.0 %</i>	<i>50 - 150</i>			B4D1415	04/14/2014	<i>04/17/2014 13:27</i>	

CET #:4040289
 Project: MCA, Easton
 Project Number: 22214

QUALITY CONTROL SECTION

Batch B4D1415 - EPA 8082A

Analyte	Result (mg/kg (As Rec))	RL (mg/kg (As Rec))	Spike Level	Source Result	% Rec % Rec	% Rec Limits	RPD RPD	RPD Limit	Notes
Blank (B4D1415-BLK1)					Prepared: 4/14/2014 Analyzed: 4/17/2014				
PCB-1016	ND	0.20							
PCB-1221	ND	0.20							
PCB-1232	ND	0.20							
PCB-1242	ND	0.20							
PCB-1248	ND	0.20							
PCB-1254	ND	0.20							
PCB-1260	ND	0.20							
PCB-1268	ND	0.20							
PCB-1262	ND	0.20							
<i>Surrogate: TCMX</i>					70.8	50 - 150			
<i>Surrogate: DCB</i>					83.3	50 - 150			
LCS (B4D1415-BS1)					Prepared: 4/14/2014 Analyzed: 4/17/2014				
PCB-1016	0.745	0.20	1.000		74.5	40 - 140			
PCB-1260	0.819	0.20	1.000		81.9	40 - 140			
<i>Surrogate: TCMX</i>					70.3	50 - 150			
<i>Surrogate: DCB</i>					79.6	50 - 150			
Calibration Check (B4D1415-CCV1)					Prepared: 4/14/2014 Analyzed: 4/17/2014				
PCB-1016	0.982	0.20	1.000		98.2	80 - 120			
PCB-1260	0.924	0.20	1.000		92.4	80 - 120			
<i>Surrogate: TCMX</i>					101	50 - 150			
<i>Surrogate: DCB</i>					88.5	50 - 150			
Duplicate (B4D1415-DUP1)		Source: 4040289-01			Prepared: 4/14/2014 Analyzed: 4/17/2014				
PCB-1016	ND	0.80		ND				50	
PCB-1221	ND	0.80		ND				50	
PCB-1232	ND	0.80		ND				50	
PCB-1242	ND	0.80		ND				50	
PCB-1248	ND	0.80		ND				50	
PCB-1254	ND	0.80		ND				50	
PCB-1260	ND	0.80		ND				50	
PCB-1268	ND	0.80		ND				50	
PCB-1262	ND	0.80		ND				50	
<i>Surrogate: TCMX</i>					74.7	50 - 150			
<i>Surrogate: DCB</i>					79.0	50 - 150			



80 Lupes Drive
Stratford, CT 06615

Tel: (203) 377-9984
Fax: (203) 377-9952
email: cet1@cetlabs.com

Quality Control Definitions and Abbreviations

Internal Standard (IS)	An Analyte added to each sample or sample extract. An internal standard is used to monitor retention time, calculate relative response, and quantify analytes of interest.
Surrogate Recovery	The % recovery for non-tarer organic compounds that are spiked into all samples. Used to determine method performance.
Continuing Calibration Batch	An analytical standard analyzed with each set of samples to verify initial calibration of the system. Samples that are analyzed together with the same method, sequence and lot of reagents within the same time period.
ND	Not detected
RL	Reporting Limit
Dilution	Multiplier added to detection levels (MDL) and/or sample results due to interferences and/or high concentration of target compounds.
Duplicate Result	Result from the duplicate analysis of a sample. Amount of analyte found in a sample.
Spike Level	Amount of analyte added to a sample
Matrix Spike Result	Amount of analyte found including amount that was spiked.
Matrix Spike Dup	Amount of analyte foun in duplicate spikes including amount that was spike.
Matrix Spike % Recovery	% Recovery of spiked amount in sample.
Matrix Spike Dup % Recovery	% Recovery of spiked duplicate amount in sample.
RPD	Relative percent difference between Matrix Spike and Matrix Spike Duplicate.
Blank	Method Blank that has been taken through all steps of the analysis.
LCS % Recovery	Laboratory Control Sample percent recovery. The amount of analyte recovered from a fortified sample.
Recovery Limits	A range within which specified measurements results must fall to be compliant.
CC	Calibration Verification

Flags:

H-	Recovery is above the control limits
L-	Recovery is below the control limits
B-	Compound detected in the Blank
P-	RPD of dual column results exceeds 40%
#-	Sample result too high for accurate spike recovery.



Connecticut Laboratory Certification PH0116
Massachussets Laboratory Certification M-CT903
Rhode Island Certification 199

New York Certification 11982
Florida Laboratory Certification E871064

CET #:4040289

Project: MCA, Easton

Project Number: 22214

Questions related to this report should be directed to David Ditta, Timothy Fusco, or Robert Blake at 203-377-9984.

Sincerely,



David Ditta
Laboratory Director

Report Comments:

ND is None Detected at the specified detection limit

All analyses were performed in house unless a Reference Laboratory is listed.

Samples will be disposed of 30 days after the report date.

Sample Result Flags:

E- The result is estimated, above the calibration range.

H- The surrogate recovery is above the control limits.

L- The surrogate recovery is below the control limits.

B- The compound was detected in the laboratory blank.

P- The Relative Percent Difference (RPD) of dual column analyses exceeds 40%.

D- The RPD between the sample and the sample duplicate is high. Sample Homogeneity may be a problem.

+/- The Surrogate was diluted out.

All results met standard operating procedures unless indicated by a data qualifier next to a sample result, or a narration in the QC report.

Complete Environmental Testing is only responsible for the certified testing and is not directly responsible for the integrity of the sample before laboratory receipt.



4040289

COMPLETE ENVIRONMENTAL TESTING, INC.

CUSTODY RECORD

CET #

Volatile Soils Only:

Date and Time in Freezer

Client:

CET:

Additional Analysis

80 Lupes Drive
Stratford, CT 06615

Tel: (203) 377-9984
Fax: (203) 377-9952
e-mail: cet1@celabs.com
Bottle Request e-mail: bottleorders@celabs.com

Sample ID

Matrix
A=Air S=Soil
W=Water DW=Drinking W/
C=Cassette
Solid
Other (Specify)

Turnaround Time **
(check one)
Same Day *
Next Day *
2-3 Days *
Std (5-7 Days)

20140409-P1 4/9/14 Solid X
20140409-P2 4/9/14 Solid X
20140409-P3 4/9/14 Solid X

PRESERVATIVE (Cl-HCl, N-HNO₃, S-H₂SO₄, Na-NaOH, C-Cool, O-Other)

CONTAINER TYPE (P-Plastic, G-Glass, V-Vial, O-Other)

Soil VOCs Only (M-MeOH B=Sodium W=Water F=Vial Empty E=Encore)

RELINQUISHED BY: Kevin Byrne DATE/TIME: 4/11/14 RECEIVED BY: [Signature]

RELINQUISHED BY: Kevin Byrne DATE/TIME: 4/11/14 RECEIVED BY: [Signature]

RELINQUISHED BY: [Signature] DATE/TIME: 4-11-14 RECEIVED BY: [Signature]

Client / Reporting Information

Company Name

Facility Support Services, LLC

Address

2685 State St Hamden CT 06517

City

State

Zip

Report To: Kevin Byrne E-mail: K.Byrne.FSS@SNET.NET

Phone #

Fax #

Organics

Metals (check all that apply)

Additional Analysis

- 8260 CT List
- 8260 Aromatics
- 8260 Halogens
- CT ETPH
- 8270 CT List
- 8270 PNAs
- PCBs
- Pesticides
- Herbicides
- 13 Priority Poll
- 8 RCRA
- TOTAL
- TCLP
- SPLP
- Field Filtered
- Lab To Filter

PCB by Soxhlet

TOTAL # OF CONT. NOTE #

NOTES:

Project Information

Project Contact: Kevin Byrne

PO #: -

Project: MCA

Project #: 22214

Location: Easton, CT

Collector(s): KSB

QA/QC Std Site Specific (MS/MSD) *

RCP Pkg * DQAW *

Data Report

Email PDF Excel Other

RSR Reporting Limits (check one)

GA GB SWP Other (specify) ppm

Lab Use: Evidence of Cooling: 50 °C or Y N Temp Upon Receipt

SHEET 1 OF 1

* Additional charge may apply.

** TAT begins when the samples are received at the Lab and all issues are resolved. TAT for samples received after 3 p.m. will start on the next business day.

ATTACHMENT D
MOLD ANALYTICAL DATA



EMSL Analytical, Inc.

29 North Plains Highway, Unit # 4 Wallingford, CT 06492
 Phone/Fax: 203-284-5948 / (203) 284-5978
<http://www.EMSL.com> / wallingfordlab@emsl.com

Order ID: 241401239
 Customer ID: FSS93
 Customer PO:
 Project ID:

Attn: Kevin Bogue
 Facility Support Services, LLC
 2685 State Street
 Hamden, CT 06517

Phone: (203) 288-1281
 Fax: (203) 248-4409
 Collected: 04/09/2014
 Received: 04/10/2014
 Analyzed: 04/14/2014

Proj: 22214

Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	241401239-0001			241401239-0002			241401239-0003		
Client Sample ID:	20140409-M1			20140409-M2			20140409-M3		
Volume (L):	75			75			0		
Sample Location:	BASEMENT			MUDROOM			BLANK		
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	5	200	4.4	11	460	4.5	-	-	-
Aspergillus/Penicillium	86	3600	78.6	185	7810	75.8	-	-	-
Basidiospores	7	300	6.5	8	300	2.9	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	3	100	1	-	-	-
Cladosporium	9	400	8.7	33	1400	13.6	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	5	200	1.9	-	-	-
Myxomycetes++	2	80	1.8	1	40	0.4	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	109	4580	100	246	10310	100	-	No Trace	-
Hyphal Fragment	7	300	6.5	13	550	5.3	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	42	-	-	42	-	-	0	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	0*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	-	-
Fibrous Particulate (1-4)	-	2	-	-	2	-	-	-	-
Background (1-5)	-	2	-	-	2	-	-	-	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
 Myxomycetes++ = Myxomycetes/Periconia/Smut

Gloria V. Oriol, Laboratory Manager
 or Other Approved Signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Wallingford, CT AIHA-LAP, LLC--EMLAP Lab 165118

Initial report from: 04/14/2014 12:27:44

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com



EMSL Analytical, Inc.

29 North Plains Highway, Unit # 4 Wallingford, CT 06492
 Phone/Fax: 203-284-5948 / (203) 284-5978
<http://www.EMSL.com> / wallingfordlab@emsl.com

Order ID: 241401239
 Customer ID: FSS93
 Customer PO:
 Project ID:

Attn: Kevin Bogue Phone: (203) 288-1281
 Facility Support Services, LLC Fax: (203) 248-4409
 2685 State Street Collected: 04/09/2014
 Hamden, CT 06517 Received: 04/10/2014
 Analyzed: 04/14/2014

Proj: 22214

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	241401239-0004		
Client Sample ID:	20140409-M4		
Volume (L):	150		
Sample Location:	OUTSIDE		
Spore Types	Raw Count	Count/m ³	% of Total
Alternaria	1	20	1.8
Ascospores	11	230	20.9
Aspergillus/Penicillium	1	20	1.8
Basidiospores	9	200	18.2
Bipolaris++	-	-	-
Chaetomium	-	-	-
Cladosporium	23	490	44.5
Curvularia	-	-	-
Epicoccum	-	-	-
Fusarium	-	-	-
Ganoderma	3	60	5.5
Myxomycetes++	2	40	3.6
Pithomyces	1	20	1.8
Rust	-	-	-
Scopulariopsis	-	-	-
Stachybotrys	-	-	-
Torula	1	20	1.8
Ulocladium	-	-	-
Unidentifiable Spores	-	-	-
Zygomycetes	-	-	-
Total Fungi	52	1100	100
Hyphal Fragment	6	100	9.1
Insect Fragment	-	-	-
Pollen	3	60	5.5
Analyt. Sensitivity 600x	-	21	-
Analyt. Sensitivity 300x	-	7*	-
Skin Fragments (1-4)	-	-	-
Fibrous Particulate (1-4)	-	-	-
Background (1-5)	-	1	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
 Myxomycetes++ = Myxomycetes/Periconia/Smut

Gloria V. Oriol, Laboratory Manager
 or Other Approved Signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Wallingford, CT AIHA-LAP, LLC--EMLAP Lab 165118

Initial report from: 04/14/2014 12:27:44

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com



EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Microbiology Chain of Custody

EMSL Order Number (Lab Use Only):

241401239

EMSL Analytical, Inc.
29 North Plains Hwy
Unit 4
Wallingford, CT 06492
PHONE: (203) 284-5948
FAX: (203) 284-5978

Company: Facility Support Services, LLC		EMSL-Bill to: <input type="checkbox"/> Different <input checked="" type="checkbox"/> Same <small>If Bill to is Different note instructions in Comments**</small>	
Street: 2685 State Street		Third Party Billing requires written authorization from third party	
City: Hamden	State/Province: CT	Zip/Postal Code: 06517	Country: United States
Report To (Name): Kevin Bogue		Telephone #: 203-288-1281	
Email Address: kbogue.fss@snet.net		Fax #:	Purchase Order:
Project Name/Number: 22214		Please Provide Results: <input type="checkbox"/> FAX <input checked="" type="checkbox"/> E-mail <input type="checkbox"/> Mail	
U.S. State Samples Taken: CT		Connecticut Samples: <input type="checkbox"/> Commercial <input type="checkbox"/> Residential	

Turnaround Time (TAT) Options* - Please Check

3 Hour 6 Hour 24 Hour 48 Hour 72 Hour 96 Hour 1 Week 2 Week

*Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide. TATs are subject to methodology requirements

Non Culturable Air Samples (Spore Traps) – Test Codes

• M001 Air-O-Cell	• M173 Allegro M2	• M004 Allergenco	• M032 Allergenco-D	• M172 Versa Trap
• M049 BioSIS	• M003 Burkard	• M043 Cyclex	• M002 Cyclex-d	
• M030 Micro 5	• M174 MoldSnap	• M176 Relle Smart	• M130 Via-Cell	

Other Microbiology Test Codes

<ul style="list-style-type: none"> • M041 Fungal Direct Examination • M005 Viable Fungi ID and Count • M006 Viable Fungi ID and Count (Speciation) • M007 Culturable Fungi • M008 Culturable Fungi (Speciation) • M009 Gram Stain Culturable Bacteria • M010 Bacterial Count and ID – 3 Most Prominent • M011 Bacterial Count and ID – 5 Most Prominent • M013 Sewage Contamination in Buildings 	<ul style="list-style-type: none"> • M014 Endotoxin Analysis • M015 Heterotrophic Plate Count • M180 Real Time Q-PCR-ERMI 36 Panel • M018 Total Coliform (Membrane Filtration) • M020 Fecal Streptococcus (Membrane Filtration) • M210-215 Legionella Detection • M026 Recreational Water Screen • M027 Mycotoxin Analysis 	<ul style="list-style-type: none"> • M029 Enterococci • M019 Fecal Coliform • M133 MRSA Analysis • M028 Cryptococcus neoformans Detection • M120 Histoplasma capsulatum Detection • M033-39 Allergen Testing • M044 Group Allergen (Cat, Dog, Cockroach, Dustmites) • Other See Analytical Price Guide
---	--	--

Preservation Method (Water):

Name of Sampler: **Kevin Bogue** Signature of Sampler:

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
Example: A1	Kitchen	Air	M001	75L	1/1/12 4:00 PM
20140409-m1	Basement	Air	m001	75L	4/9/14 12:38
" " -m2	Mudroom	↓	↓	75L	4/9/14 12:57
" " -m3	Blank	↓	↓	0L	4/9/14 1:00
" " -m4	outside	↓	↓	150L	4/9/14 1:02

Client Sample # (s): m1 - m4 Total # of Samples: 4

Relinquished (Client): *Kevin Bogue* Date: Time:

Received (Client): Date: Time:

Comments:

RECEIVED
APR 10 2014
By *JG* 17:10
walka

ATTACHMENT E
LEAD ANALYTICAL DATA

80 Lupes Drive
Stratford, CT 06615



Tel: (203) 377-9984
Fax: (203) 377-9952
e-mail: cet1@cetlabs.com

Client: Mr. Kevin Bogue
Facility Support Services
2685 State Street
Hamden, CT 06517

Analytical Report

CET# 4040425

Report Date: April 21, 2014
Project: 22214, Easton
Project Number: 22214

Connecticut Laboratory Certificate: PH 0116
Massachusetts laboratory Certificate.: M-CT903
Rhode Island Certification: 199



New York Certification: 11982
Florida Laboratory Certification: E871064

CET #:4040425
Project: 22214, Easton
Project Number: 22214

SAMPLE SUMMARY

The sample(s) were received at 4.0°C.

This report contains analytical data associated with following samples only.

Sample ID	Laboratory ID	Matrix	Collection Date/Time	Receipt Date
-----------	---------------	--------	----------------------	--------------

22214041614_01	4040425-01	Solid	4/16/2014 14:00	04/17/2014
----------------	------------	-------	-----------------	------------

Analyte: TCLP Lead [EPA 6010C]

Analyst: SS

Matrix: Extract

Laboratory ID	Client Sample ID	Result	RL	Units	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
---------------	------------------	--------	----	-------	----------	-------	----------	--------------------	-------

4040425-01	22214041614_01	0.037	0.013	mg/L	1	B4D1829	04/18/2014	04/18/2014 16:22	
------------	----------------	--------------	-------	------	---	---------	------------	------------------	--

CET #:4040425
 Project: 22214, Easton
 Project Number: 22214

QUALITY CONTROL SECTION

Batch B4D1829 - EPA 6010C

Analyte	Result (mg/L)	RL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Blank (B4D1829-BLK1)									Prepared: 4/18/2014 Analyzed: 4/18/2014
Lead	ND	0.013							
LCS (B4D1829-BS1)									Prepared: 4/18/2014 Analyzed: 4/18/2014
Lead	0.185	0.013	0.200		92.3	80 - 120			
Duplicate (B4D1829-DUP1)									Prepared: 4/18/2014 Analyzed: 4/18/2014
Lead	0.0379	0.013		0.0369			2.67	20	
Matrix Spike (B4D1829-MS1)									Prepared: 4/18/2014 Analyzed: 4/18/2014
Lead	0.226	0.013	0.200	0.0369	94.6	75 - 125			
Matrix Spike Dup (B4D1829-MSD1)									Prepared: 4/18/2014 Analyzed: 4/18/2014
Lead	0.228	0.013	0.200	0.0369	95.6	75 - 125	0.837	20	



80 Lupes Drive
Stratford, CT 06615

Tel: (203) 377-9984
Fax: (203) 377-9952
email: cet1@cetlabs.com

Quality Control Definitions and Abbreviations

Internal Standard (IS)	An Analyte added to each sample or sample extract. An internal standard is used to monitor retention time, calculate relative response, and quantify analytes of interest.
Surrogate Recovery	The % recovery for non-tarer organic compounds that are spiked into all samples. Used to determine method performance.
Continuing Calibration Batch	An analytical standard analyzed with each set of samples to verify initial calibration of the system. Samples that are analyzed together with the same method, sequence and lot of reagents within the same time period.
ND	Not detected
RL	Reporting Limit
Dilution	Multiplier added to detection levels (MDL) and/or sample results due to interferences and/or high concentration of target compounds.
Duplicate Result	Result from the duplicate analysis of a sample. Amount of analyte found in a sample.
Spike Level	Amount of analyte added to a sample
Matrix Spike Result	Amount of analyte found including amount that was spiked.
Matrix Spike Dup	Amount of analyte foun in duplicate spikes including amount that was spike.
Matrix Spike % Recovery	% Recovery of spiked amount in sample.
Matrix Spike Dup % Recovery	% Recovery of spiked duplicate amount in sample.
RPD	Relative percent difference between Matrix Spike and Matrix Spike Duplicate.
Blank	Method Blank that has been taken through all steps of the analysis.
LCS % Recovery	Laboratory Control Sample percent recovery. The amount of analyte recovered from a fortified sample.
Recovery Limits	A range within which specified measurements results must fall to be compliant.
CC	Calibration Verification

Flags:	
H-	Recovery is above the control limits
L-	Recovery is below the control limits
B-	Compound detected in the Blank
P-	RPD of dual column results exceeds 40%
#-	Sample result too high for accurate spike recovery.



Connecticut Laboratory Certification PH0116
Massachussets Laboratory Certification M-CT903
Rhode Island Certification 199

New York Certification 11982
Florida Laboratory Certification E871064

CET #:4040425

Project: 22214, Easton

Project Number: 22214

Questions related to this report should be directed to David Ditta, Timothy Fusco, or Robert Blake at 203-377-9984.

Sincerely,



David Ditta
Laboratory Director

Report Comments:

ND is None Detected at the specified detection limit

All analyses were performed in house unless a Reference Laboratory is listed.

Samples will be disposed of 30 days after the report date.

Sample Result Flags:

E- The result is estimated, above the calibration range.

H- The surrogate recovery is above the control limits.

L- The surrogate recovery is below the control limits.

B- The compound was detected in the laboratory blank.

P- The Relative Percent Difference (RPD) of dual column analyses exceeds 40%.

D- The RPD between the sample and the sample duplicate is high. Sample Homogeneity may be a problem.

+/- The Surrogate was diluted out.

All results met standard operating procedures unless indicated by a data qualifier next to a sample result, or a narration in the QC report.

Complete Environmental Testing is only responsible for the certified testing and is not directly responsible for the integrity of the sample before laboratory receipt.



4040425

COMPLETE ENVIRONMENTAL TESTING, INC.

F CUSTODY RECORD

CET #
Volatle Soils Only:
Date and Time in Freezer
Client:
CET:

80 Lupes Drive
Stratford, CT 06615
Tel: (203) 377-9984
Fax: (203) 377-9952
e-mail: cet1@cellabs.com
Bottle Request e-mail: bottleorders@cellabs.com

Matrix table with columns: Matrix (A=Air, S=Soil, W=Water, DW=Drinking W, C=Cassette, Solid, Wipe, Other), Turnaround Time (Same Day, Next Day, 2-3 Days, Std 5-7 Days)

Sample ID: 22214 091614_01 Date/Time: 4/16/14 2:00 pm Matrix: Solid Turnaround Time: Std (5-7 Days) X

Table with columns for Organic and Metal analysis (8260 CT List, 8260 Aromatics, 8260 Halogens, CT ETPH, 8270 CT List, 8270 PNAs, PCBs, Pesticides, Herbicides, 13 Priority Poll, 8 RCRA, TOTAL, TCLP, SPLP, Field Filtered, Lab To Filter, X TCLP Lead)

RESERVATIVE (C=HCl, N=HNO3, S=H2SO4, Na=NaOH, C=Cool, O=Other) CONTAINER TYPE: B-Plastic, G-Glass, V-Vial, O-Other

Soil VOCs Only (M=Mech B= Sodium Bisulfate W=Water F= Empty Vial E=Encore) RELINQUISHED BY: K. Begue DATE/TIME: 4/16/14 RECEIVED BY: J. [Signature] DATE/TIME: 4/16/14 9:00 RECEIVED BY: [Signature]

Client / Reporting Information

Company Name: Facility Support Services, LLC Address: 2685 State Street City: Hamden State: CT Zip: 06517 Report To: K. Begue E-mail: K.Begue,FSS@SUNET.NET Phone #: 203.208-1231 Fax #: 203.249-4409

Project Information

Project Contact: K. Begue PO #: Project #: Location: Easton, CT Collector(s): KSB QA/QC: [X] Std [] Site Specific (MS/MSD) * Data Report: [X] Email [] PDF [] Excel [] Other RSR Reporting Limits (check one) [] GA [] GB [] SWP [X] Other (specify) < 5 ug/L Lab Use: Evidence of Cooling: 4.0 (Y) °C or N SHEET 1 OF 1 Temp Upon Receipt:

* Additional charge may apply. ** TAT begins when the samples are received at the Lab and all issues are resolved. TAT for samples received after 3 p.m. will start on the next business day. REV. 12/11

ATTACHMENT F
RADON ANALYTICAL DATA

Site Radon Inspection Report

Date : 04/21/2014

Mr. Kevin Bogne
FACILITY SUPPORT SVCS., LLC
2685 State Street
Hamden, CT 06517-

Client: Unknown
Test Location: 91 Dogwood Road
Easton, CT 06612-

Individual Canister Results

The results indicate that at least one testing device registered at or above the United States Environmental Protection Agency (EPA) action level of 4.0 picoCuries per liter of air (pCi/L). The EPA recommends mitigation if the average of two short-term tests taken in the lowest level of the building suitable for occupancy show radon levels that are equal to or greater than 4.0 pCi/L.

For information on how to reduce radon levels in your home, please review the EPA booklet: Consumer's Guide to Radon Reduction (www.epa.gov/radon/pdfs/consguid.pdf) and contact your state health department. The EPA maintains a radon information website, including copies of its publications, at www.epa.gov/iaq/radon.

For New Jersey clients: Please see the attached guidance document entitled Radon Testing and Mitigation: The Basics for further information.

For New York clients: If the radon level of one or more testing devices is equal to or exceeds 20 pCi/L please contact the New York State Department of Health, Bureau of Environmental Radiation Protection, for technical advice and assistance at 518-402-7556 or toll free 1-800-458-1158.

PLEDGE OF ASSURED QUALITY

All procedures used for generating this report are in complete accordance with the current EPA protocols for the analysis of radon in air (EPA 402-R-92-004). The analytical results relate only to the samples tested, in the condition received by the lab, and that calculations were based upon the information supplied by client. RTCA and its personnel do not assume responsibility or liability, collectively and individually, for analysis results when detectors have been improperly handled or placed by the consumer, nor does RTCA and its personnel accept responsibility for any financial or health consequences of subsequent action or lack of action, taken by the customer or its consultants based on RTCA-provided results.



Andreas C. George

Andreas C. George
Radon Measurement Specialist
NJ MES 11089

Dante Galan

Dante Galan
Laboratory Director

NRSB ARL0001
NYS ELAP ID: 10806
PADEP ID: 0346
NJDEP ID: NY933
NJ MEB 90036
FL DOH RB1609



Facility Support Services, LLC

Environmental & Safety Consulting Engineers

May 28, 2014

Mr. Matthew Ranando
Civil Engineer
Martinez Couch & Associates LLC
1084 Cromwell Avenue, Suite A-2
Rocky Hill Connecticut 06067

Re: Supplemental Inspection Results – Lead Paint and Radon Inspection
Community Development Block Grant – Disaster Recovery
Owner Occupied Recovery and Rehabilitation Program
91 Dogwood Drive, Easton, Connecticut
Inspection Date: May 14, 2014

Dear Mr. Ranando:

Facility Support Services, LLC (FSS) is issuing this letter-report summarizing the supplemental lead inspection of the residential structure at the above-referenced property. Following the guidelines of the Connecticut Department of Housing (CT DOH), for the Community Development Block Grant – Disaster Recovery program, a lead inspection and testing investigation was conducted to ascertain potential environmental concerns at the residence. This investigation and others are related to the repair/replacement of items damaged by the October 2012 Tropical Storm Sandy.

Lead Painted Materials

The subject residential structure was built prior to 1978 (1951) and therefore the likelihood that lead painted surfaces are present is increased. As a residential structure built prior to 1978 the removal of lead painted materials where a child under 6 is housed, or may visit, would trigger the EPA Renovation, Repair and Painting (RRP) rule. Furthermore, adherence to the requirements of The Lead-Safe Housing Rule (US Department of Housing and Urban development, HUD) are stipulated by the Connecticut Department of Housing (DOH) as part of the Community Development Block Grant – Disaster Recovery Owner Occupied Recovery and Rehabilitation Program.

A building wide XRF inspection was conducted by Maureen Monaco of Gilberto Lead Inspections, LLC (Gilbertco) utilizing a Scitec Map4 Portable X-Ray Fluoroscope Spectrum Analyzer with a Cobalt 57 source. The findings of the investigation determined that several exterior areas tested positive for lead based paint ($>1.0 \text{ mg/cm}^2$), including: soffit and fascia board, interior garage door trim, and the trim and sill associated with the newer type of windows. Only the window components were found in intact condition, the other materials (exposed soffit and fascia board, located in rear of building), and the garage door trim were found in non-intact (damaged) condition. A copy of the Gilbertco Lead Inspection Report is provided in Appendix A. Following the HUD Lead Safe Housing Guidelines, non-intact lead-containing materials shall have interim measures conducted to reduce the lead hazard.



Facility Support Services, LLC

Environmental & Safety Consulting Engineers

Radon Evaluation

FSS retested the subject residence on May 14, 2014 to further evaluate the presence of radon detected during the initial sampling event (conducted between April 9 and April 21, 2014).

In that April evaluation three canisters were placed in the boiler room (two side by side in the boiler portion of the basement, and a third in the other portion of the basement). The primary Boiler Room sample (Sample #2315134) contained 4.2 pCi/L, above the 4.0 pCi/L action level established by the US EPA. The duplicate sample from this area (Sample #2315114), contained 3.9 pCi/L. The average for these two samples is 4.05 pCi/L. EPA radon protocols for sampling calls for re-testing when the average of the two samples are above 4.0 pCi/L.

Radon re-testing was conducted by Mr. Kevin Bogue. Test results were obtained by using a passive activated charcoal device manufactured and analyzed by Radon Testing Corporation of America of Elmsford, New York. The test devices are individually numbered and marked with a bar code for identification (RTCA 4 Pass Charcoal Canister, NRSB Device Code 10331).

Devices were placed in two basement rooms of the residence on May 14, 2014 and retrieved on May 16, 2014. As with the initial evaluation, two canisters were placed in the boiler portion of the basement on table with a yellow "Do Not Disturb Test in Progress" warning sign placed beneath the test device. The homeowner was reminded to not open windows or to allow anyone to tamper with the test device. Testing time for the evaluation was approximately 48.75 hours. QA/QC consisted of the collection of a duplicate sample (from boiler room) and a blank.

The Radon canisters were submitted to Radon Testing Corporation of America for analysis. The analytical results for samples were reported at 3.8 and 3.9 pCi/L. The blank sample contained 0.1 pCi/L. Analytical result reports are included in Appendix B. Since the results are below the 4.0 pCi/L, no radon mitigation measures are proposed at this time.

If you have any questions or require clarification on the above, please call me at (203) 288-1281.

Respectfully,
Facility Support Services, LLC

Kevin Bogue, LEP, CHMM
Project Manager

ATTACHMENT A
LEAD BASED PAINT INSPECTION
REPORT OF FINDINGS

**LEAD BASED PAINT INSPECTION
REPORT OF FINDINGS
OF:**

**91 DOGWOOD AVENUE
EASTON, CONNECTICUT**



DATE:
May 14, 2014

**PREPARED BY:
GILBERTCO LEAD INSPECTIONS LLC
287 MAIN STREET
ANSONIA, CONNECTICUT 06401**



GILBERTCO LEAD INSPECTIONS, LLC

“LEAD BASED PAINT SPECIALIST”

May 14, 2014

Job 9928-2-91

Kevin Bogue, LEP, CHMM
Facility Support Services, LLC
2685 State Street
Hamden, Connecticut 06517

**Re: Lead Based Paint Inspection: 91 Dogwood Road, Easton, Connecticut
Ron Terebisi- Applicant # 1111**

Gilbertco Lead Inspections LLC performed a limited XRF inspection for the presence of lead based paint at 91 Dogwood Road, Easton, Connecticut. The inspection was requested by Facility Support Services in response to distribution of HUD funds given to CT DOH for Storm Sandy repair work.

The site inspected consists of a single family ranch style home built about 1951. The exterior is vinyl sided with vinyl replacement windows throughout. The home was vacant at the time of inspection. Several ceilings in interior rooms have been removed with clear access to the roof.

In accordance with HUD/EPA guidance issued June 26, 1996, the Scitec Map 4 Spectrum Analyzer was used in the “Unlimited” assaying mode. This enables the equipment to accurately determine whether the result is “Positive”, above the 1.0 mg/cm² action level or “Negative”, below the action level regardless of precision or operator bias. In accordance with the above guidance, values of 0.91 mg/cm² through 1.19 mg/cm² are considered “Inconclusive”, meaning the value level of lead in paint was so close to the 1.0 mg/cm² action level that further analysis by XRF would not result in a “Positive” or “Negative” answer. Only laboratory analysis of the paint film can determine actual values in this range. Chip sampling of inconclusive was not included in the scope of this report, therefore, any results above 0.9 mg/cm² are considered positive. Results are arranged floor plan style with the substrate and condition noted. Orientation of rooms places side ‘one’ as street side, with side ‘two’ to the left, side ‘three’ opposite, and wall ‘four’ to the right. Rooms were tested in a clockwise pattern.

In regards to the above mentioned property, *several exterior areas tested positive for based paint*. The exposed area under the soffit and fascia board in the rear of the property tested positive for lead. The interior of the garage door trim tested positive along with the newer interior window trim in the rear of the garage. *See picture below*



Lead in dust was not included in the scope of this report. Only laboratory analysis can insure that no lead dust hazards remain after renovations or everyday use of the home.

Although soil was not tested for lead, it can be presumed positive unless proven otherwise. Vegetable plants should not be planted near the perimeter of the house or in water runoff areas. Children should not be allowed to play in bare soil areas adjacent to the house. Asphalt, bushes, mulch, or good quality grass covering are acceptable deterrents. These deterrents are in place.

Please feel free to call if any questions arise,

Maureen Monaco

Maureen Monaco

Director of Operations

Consultant Contractor #270

Lead Inspector Risk Assessor #1172

Lead Abatement Supervisor #2383

**CERTIFICATION
LEAD IN PAINT RESULTS**

AGENCY: GILBERTCO LEAD INSPECTIONS LLC
287 MAIN STREET
ANSONIA, CONNECTICUT 06401

PROJECT ADDRESS: 91 DOGWOOD DRIVE
EASTON, CONNECTICUT

PROJECT NUMBER: 9928-2-91

TEST DATE: MAY 14, 2014

REQUIREMENTS: CHAPTER 7 HUD GUIDELINES
LEAD INSPECTION- SURFACE BY SURFACE

INSTRUMENTATION: SCITEC MAP4 PORTABLE X-RAY (BRUKER HANDHELD)
FLUOROSCOPE SPECTRUM ANALYZER
(XRF) COBALT 57 SOURCE

REPORT MEDIUM: MG PB/CM2 (MILLIGRAMS OF LEAD
PER SQUARE CENTIMETER)

CALIBRATION: TO MEASURE LEAD K-SHELL EMISSIONS.
FACTORY CALIBRATED WITH HUD APPROVED
REFERENCE STANDARDS. CALIBRATION FIELD
CHECKED HOURLY AS RECOMMENDED BY
MANUFACTURER

OPERATORS CERTIFICATION: LEAD CONSULTANT CONTRACTOR-CC270
LEAD INSPECTOR RISK ASSESSOR- IR 1172
LEAD ABATEMENT SUPERVISOR- 2383

I hereby certify to the best of my knowledge and capabilities that this report reflects the true lead content of the surfaces tested in this report on this date.

Maurice N. Rao 5/14/2014

**91 Dogwood Drive, Easton, Connecticut
May 14, 2014**

Room Type	Room #	Wall #	Component	Substrate	Condition	K Shell	Decision
Calibration						1.14	okay
Exterior	1	1	Door	Metal	Non-intact	0.47	Negative
Exterior	1	1	Basement wnd	Wood	Non-intact	0.09	Negative
Exterior	1	4	Basement wnd	Wood	Non-intact	0.37	Negative
Exterior	1	3	Basement wnd	Wood	Non-intact	-0.15	Negative
Exterior	1	3	Soffit	Wood	Non-intact	0.1	Negative
Exterior	1	3	exposed Fascia	Wood	Non-intact	2.95	Positive
Exterior	1	3	exposed Soffit	Wood	Non-intact	3.81	Positive
Foyer	2	1	Door	Other	Intact	-0.14	Negative
Foyer	2	1	Door Casing	Wood	stain/varnish	0.04	Negative
Foyer	2	4	Wall	Sheetrk	Intact	0.21	Negative
Foyer	2	4	Baseboard	Wood	Intact	-0.02	Negative
Foyer	2	1	Ceiling	Sheetrk	Intact	0.03	Negative
Foyer	2	3	Wall	Sheetrk	Intact	0.17	Negative
Foyer	2	3	Door Casing	Wood	Intact	0.11	Negative
Foyer	2	3	Door	Wood	stain/varnish	0.04	Negative
Foyer	2	3	Door Casing	Wood	Intact	0.38	Negative
Foyer	2	2	Wall	Sheetrk	Intact	0.08	Negative
Foyer	2	2	Door Jamb	Wood	Non-intact	0.05	Negative
Kitchen	3	1	Wall	Sheetrk	Intact	0.21	Negative
Kitchen	3	1	Baseboard	Wood	Intact	0.31	Negative
Kitchen	3	1	Window Sill	Wood	Non-intact	-0.05	Negative
Kitchen	3	1	Window Trim	Wood	Non-intact	-0.13	Negative
Kitchen	3	2	Wall	Sheetrk	Intact	0.27	Negative
Kitchen	3	2	Window Sill	Wood	Intact	0.26	Negative
Kitchen	3	2	Window Trim	Wood	Intact	-0.36	Negative
Kitchen	3	2	Window Apron	Wood	Intact	-0.29	Negative
Kitchen	3	2	Radiator	Metal	Non-intact	0.49	Negative
Kitchen	3	2	Baseboard	Wood	Non-intact	0.33	Negative
Kitchen	3	2	Cabinet	Metal	Intact	0.08	Negative
Kitchen	3	2	Window Sill	Wood	Non-intact	-0.07	Negative
Kitchen	3	2	Window Trim	Wood	Non-intact	-0.26	Negative
Kitchen	3	3	Wall	Sheetrk	Intact	0.13	Negative
Kitchen	3	3	Cabinet	Metal	Intact	0.11	Negative
Kitchen	3	1	Ceiling	Sheetrk	Non-intact	-0.36	Negative
Kitchen	3	4	Wall	Sheetrk	Intact	0.17	Negative
Kitchen	3	4	Door Casing	Wood	Intact	0.27	Negative
Kitchen	3	4	Door Jamb	Wood	Non-intact	0.22	Negative
Kitchen	3	4	Wall	Sheetrk	Non-intact	0.4	Negative
Kitchen	3	4	Baseboard	Wood	Intact	0.08	Negative
Kitchen	3	3	Door Casing	Wood	Intact	0.65	Negative
Kitchen	3	3	Door to dining rm	Wood	Stain/varnish	-0.13	Negative

91 Dogwood Drive, Easton, Connecticut

May 14, 2014

Kitchen	3	4 Wall (green)	Sheetrk	Intact	-0.01	Negative
Dining Room	4	1 Door Casing	Wood	Intact	0.12	Negative
Dining Room	4	1 Wall	Sheetrk	Intact	0.1	Negative
Dining Room	4	1 Baseboard	Wood	Intact	0.05	Negative
Dining Room	4	2 Wall	Sheetrk	Intact	-0.52	Negative
Dining Room	4	2 Door Casing	Wood	Intact	0.05	Negative
Dining Room	4	2 Baseboard	Wood	Intact	-0.16	Negative
Dining Room	4	3 Wall	Sheetrk	Intact	0.34	Negative
Dining Room	4	3 Window Sill	Wood	Non-intact	0.54	Negative
Dining Room	4	3 Window Trim	Wood	Non-intact	-0.04	Negative
Dining Room	4	3 Window Apron	Wood	Intact	-0.12	Negative
Dining Room	4	3 Radiator	Metal	Intact	0.33	Negative
Dining Room	4	4 Wall	Sheetrk	Intact	-0.25	Negative
Dining Room	4	4 Door Casing	Wood	Intact	0.06	Negative
Dining Room	4	4 Door Jamb	Wood	Intact	0.12	Negative
Dining Room	4	4 Baseboard	Wood	Intact	-0.21	Negative
Living Room	5	1 Door Casing	Wood	Intact	0.17	Negative
Living Room	5	1 Wall	Sheetrk	Intact	-0.23	Negative
Living Room	5	3 Wall	Sheetrk	Intact	0.05	Negative
Living Room	5	3 Door	Metal	Intact	-0.09	Negative
Living Room	5	3 Door Casing	Wood	stain/varnish	-0.22	Negative
Living Room	5	3 Baseboard	Wood	Intact	0.12	Negative
Living Room	5	3 Floor	Wood	stain/varnish	0.08	Negative
Living Room	5	3 Window Sill	Wood	Intact	0.75	Negative
Living Room	5	3 Window Trim	Wood	Intact	0.64	Negative
Living Room	5	3 Window Apron	Wood	Intact	0.15	Negative
Living Room	5	3 Radiator	Metal	Intact	-0.16	Negative
Living Room	5	4 Wall	Sheetrk	Intact	-0.52	Negative
Living Room	5	4 Baseboard	Wood	Intact	0.09	Negative
Living Room	5	4 Door Casing	Wood	Intact	0.14	Negative
Living Room	5	1 Wall	Sheetrk	Intact	0.19	Negative
Living Room	5	1 Mantle	Wood	Intact	0.11	Negative
Living Room	5	1 Door Casing	Wood	Intact	0.21	Negative
Living Room	5	1 Baseboard	Wood	Intact	-0.05	Negative
Living Room	5	2 Wall	Sheetrk	Intact	0.12	Negative
Living Room	5	2 Baseboard	Wood	Intact	-0.04	Negative
Sunroom	6	3 Floor	Masonry	Non-intact	0.3	Negative
Sunroom	6	3 Wall	Wood	Intact	0.05	Negative
Sunroom	6	1 Ceiling	Wood	Stain/varnish	-0.3	Negative
Sunroom	6	1 Ceiling Trim	Wood	Intact	0.53	Negative
Bedroom	7	2 Door	Wood	Stain/varnish	0.14	Negative
Bedroom	7	2 Door Jamb	Wood	Intact	0.07	Negative
Bedroom	7	2 Door Casing	Wood	Intact	0.29	Negative

91 Dogwood Drive, Easton, Connecticut

May 14, 2014

Bedroom	7	2 Wall	Sheetrk	Intact	-0.26	Negative
Bedroom	7	2 Baseboard	Wood	Intact	0.2	Negative
Bedroom	7	3 Wall	Sheetrk	Intact	0.22	Negative
Bedroom	7	3 Baseboard	Wood	Intact	0.34	Negative
Bedroom	7	3 Window Sill	Wood	Intact	0.69	Negative
Bedroom	7	3 Window Trim	Wood	Intact	0.33	Negative
Bedroom	7	3 Radiator	Metal	Intact	0.32	Negative
Bedroom	7	4 Wall	Sheetrk	Intact	0.59	Negative
Bedroom	7	4 Baseboard	Wood	Intact	0.37	Negative
Bedroom	7	4 Window Sill	Wood	Intact	0.35	Negative
Bedroom	7	4 Window Trim	Wood	Intact	0.59	Negative
Bedroom	7	1 Wall	Sheetrk	Intact	0.45	Negative
Bedroom	7	1 Baseboard	Wood	Intact	0.24	Negative
Bedroom	7	1 Radiator	Metal	Intact	-0.03	Negative
Bedroom	7	2 Closet Door	Wood	Stain/varnish	-0.04	Negative
Bedroom	7	2 Clo Dr Csng	Wood	Intact	0.41	Negative
Bedroom	7	2 Wall	Sheetrk	Intact	-0.21	Negative
Bedroom	7	2 Shelf	Wood	Non-intact	-0.04	Negative
Bedroom	7	2 Shelf Support	Wood	Non-intact	-0.03	Negative
Bedroom	7	2 Wall	Sheetrk	Intact	0.54	Negative
Bedroom	7	2 Baseboard	Wood	Intact	0.26	Negative
Bedroom	7	1 Floor	Wood	Stain/varnish	-0.44	Negative
Hallway	8	1 Wall	Sheetrk	Intact	0.03	Negative
Hallway	8	1 Baseboard	Wood	Intact	0.04	Negative
Hallway	8	1 Closet Door	Wood	Stain/varnish	-0.31	Negative
Hallway	8	1 Clo Dr Csng	Wood	Intact	-0.52	Negative
Hallway	8	3 Shelf	Wood	Intact	-0.16	Negative
Hallway	8	3 Shelf SUpport	Wood	Intact	0.06	Negative
Hallway	8	1 Wall	Sheetrk	Intact	-0.23	Negative
Hallway	8	1 Ceiling Door	Sheetrk	Intact	0	Negative
Hallway	8	1 Ceiling	Sheetrk	Intact	-0.23	Negative
Hallway	8	3 Closet Door	Wood	Stain/varnish	0.1	Negative
Hallway	8	3 Clo Dr Csng	Wood	Intact	-0.04	Negative
Hallway	8	3 Shelf	Wood	Intact	0.16	Negative
Hallway	8	3 Shelf SUpport	Wood	Intact	-0.09	Negative
Office	9	3 Door	Wood	Stain/varnish	-0.45	Negative
Office	9	3 Door Casing	Wood	Intact	0.03	Negative
Office	9	3 Wall	Sheetrk	Intact	-0.34	Negative
Office	9	3 Baseboard	Wood	Intact	0.05	Negative
Office	9	4 Closet Door	Wood	Stain/varnish	-0.09	Negative
Office	9	4 Clo Dr Csng	Wood	Stain/varnish	0.07	Negative
Office	9	4 Wall	Sheetrk	Intact	0	Negative
Office	9	4 Baseboard	Wood	Intact	-0.27	Negative
Office	9	1 Wall	Sheetrk	Intact	0.16	Negative
Office	9	1 Window Sill	Wood	Intact	-0.02	Negative

91 Dogwood Drive, Easton, Connecticut

May 14, 2014

Office	9	1 Window Trim	Wood	Intact	-0.08	Negative
Office	9	1 Radiator	Metal	Intact	0.02	Negative
Office	9	1 Baseboard	Wood	Intact	0.03	Negative
Office	9	2 Wall	Sheetrk	Intact	0.27	Negative
Office	9	2 Baseboard	Wood	Intact	-0.22	Negative
Office	9	1 Floor	Wood	Stain/varnish	-0.32	Negative
Office	9	1 Ceiling	Sheetrk	Intact	-0.04	Negative
Bathroom	10	3 Door	Wood	Stain/varnish	0.03	Negative
Bathroom	10	3 Door Jamb	Wood	Intact	0.08	Negative
Bathroom	10	3 Door Casing	Wood	Intact	-0.31	Negative
Bathroom	10	3 Wall	Sheetrk	Intact	0.17	Negative
Bathroom	10	4 Wall	Sheetrk	Intact	-0.23	Negative
Bathroom	10	4 Radiator	Metal	Intact	0.43	Negative
Bathroom	10	4 Window Sash	Wood	non-intact	0.31	Negative
Bathroom	10	1 Window Trim	Wood	Intact	-0.24	Negative
Bathroom	10	2 Wall	Sheetrk	Intact	0.16	Negative
Mudroom	11	4 Door Casing	Wood	Stain/varnish	-0.24	Negative
Mudroom	11	3 Window Sill	Wood	Non-intact	-0.1	Negative
Mudroom	11	3 Window Trim	Wood	Intact	-0.18	Negative
Mudroom	11	3 Window Apron	Wood	Intact	-0.1	Negative
Mudroom	11	3 Radiator	Wood	Intact	0.11	Negative
Mudroom	11	3 Baseboard	Wood	Intact	0.05	Negative
Mudroom	11	2 Wall	Other	Intact	-0.05	Negative
Mudroom	11	3 Baseboard	Wood	Stain/varnish	0.2	Negative
Mudroom	11	1 Door	Metal	Intact	-0.2	Negative
Mudroom	11	1 Door Casing	Wood	Intact	0.12	Negative
Mudroom	11	1 Wall	Other	Intact	0.25	Negative
Mudroom	11	1 Baseboard	Wood	Stain/varnish	-0.04	Negative
Mudroom	11	1 Window Sill	Wood	Stain/varnish	0.09	Negative
Mudroom	11	1 Window Trim	Wood	Stain/varnish	0.13	Negative
Mudroom	11	1 Baseboard	Wood	Stain/varnish	0.04	Negative
Mudroom	11	4 Wall	Other	Intact	0.06	Negative
Mudroom	11	4 Door Casing	Wood	Stain/varnish	-0.11	Negative
Mudroom	11	4 Ceiling	Other	Non-intact	-0.28	Negative
Mudroom	11	1 CeilingTrim	Wood	Intact	-0.13	Negative
Basement	12	4 Wall	Sheetrk	Intact	-0.22	Negative
Basement	12	4 Wall	Sheetrk	Intact	-0.34	Negative
Basement	12	4 Ceiling	Sheetrk	Intact	0.15	Negative
Basement	12	1 Stair Tread	Wood	Stain/varnish	-0.45	Negative
Basement	12	1 Stair Riser	Wood	Stain/varnish	-0.01	Negative
Basement	12	1 Railing	Metal	Intact	0.37	Negative
Garage-int	13	1 Door Casing	Wood	Non-intact	1.7	Positive
Garage-int	13	1 Ceiling	Masonry	Non-intact	0.33	Negative

91 Dogwood Drive, Easton, Connecticut

May 14, 2014

Garage-int	13	4 Wall	Masonry	Non-intact	-0.05	Negative
Garage-int	13	3 Wall	Masonry	Non-intact	-0.38	Negative
Garage-int	13	3 Window Trim*	Wood	Intact	1.92	Positive
Garage-int	13	3 Window Trim*	Wood	Intact	2.22	Positive
Garage-int	13	3 Window Sill*	Wood	Intact	1.92	Positive
Garage-int	13	3 Window Apron*	Wood	Intact	0.84	Negative
Garage-int	13	3 Window Trim*	Wood	Intact	1.48	Positive
		*appears new				

MANAGEMENT PLAN
FOR
INTACT LEAD-BASED PAINT CONTAINING SURFACES

As a homeowner, you should know that painted surfaces throughout this house have been found to contain toxic levels of lead. These surfaces do not have to be abated as they are presently intact. Lead paint and lead dust pose a health risk and are especially dangerous to young children and pregnant woman. The inspection report lists areas that contain lead based paint. Lead paint is presumed to exist on all similarly painted surfaces whether tested or not. If currently intact surfaces become nonintact then lead hazard remediation procedures must be invoked.

As the homeowner, you are responsible for observing and monitoring all areas that have been identified or presume to contain lead based paint. Further testing and possible abatement may be needed if any of the surfaces are to be disturbed during renovations or if the surfaces become damaged. Defective surfaces are characterized by cracking, blistering, chalking or peeling paint. If any of these conditions arise, you should contact a qualified lead abatement contractor, a Renovate Right Certified Contractor or the local health department. Do not attempt to remove lead containing surfaces yourself as the lead dust that may arise is extremely hazardous.

As the homeowner, you are responsible for warning all persons entering your home that lead based paint is present. This includes tenants, visitors, etc. In April 2010, a new EPA regulation requires that any contractor who disturbs more than six square feet of painted surface must be certified as a Renovate Right Contractor. Homeowners are allowed to do their own renovation but are not exempt from providing renovation notices or posting informational signs. Further information regarding Renovate Right may be obtained at www.epa.gov/lead/pubs/renovation or by calling the National Lead Information Center at 1-800-424-LEAD (5323).

Children are especially susceptible to lead hazards. As with any lead containing surface, children should not be allowed to mouth or chew on woodwork. Hygiene practices must include hand washing before meals.

If any child is found to have an elevated blood lead level then you must notify the local health department.

Disclosure of Information on Lead-Based Paint and/or Lead-Based Paint Hazards

Lead Warning Statement

Housing built before 1978 may contain lead-based paint. Lead from paint, paint chips, and dust can pose health hazards if not managed properly. Lead exposure is especially harmful to young children and pregnant women. Before renting pre-1978 housing, lessors must disclose the presence of known lead-based paint and/or lead-based paint hazards in the dwelling. Lessees must also receive a federally approved pamphlet on lead poisoning prevention.

Lessor's Disclosure

(a) Presence of lead-based paint and/or lead-based paint hazards (check (i) or (ii) below):
(i) _____ Known lead-based paint and/or lead-based paint hazards are present in the housing (explain).

(ii) _____ Lessor has no knowledge of lead-based paint and/or lead-based paint hazards in the housing.

(b) Records and reports available to the lessor (check (i) or (ii) below):

(i) _____ Lessor has provided the lessee with all available records and reports pertaining to lead-based paint and/or lead-based paint hazards in the housing (list documents below).

(ii) _____ Lessor has no reports or records pertaining to lead-based paint and/or lead-based paint hazards in the housing.

Lessee's Acknowledgment (initial)

(c) _____ Lessee has received copies of all information listed above.

(d) _____ Lessee has received the pamphlet *Protect Your Family from Lead in Your Home*.

Agent's Acknowledgment (initial)

(e) _____ Agent has informed the lessor of the lessor's obligations under 42 U.S.C. 4852d and is aware of his/her responsibility to ensure compliance.

Certification of Accuracy

The following parties have reviewed the information above and certify, to the best of their knowledge, that the information they have provided is true and accurate.

_____ Lessor	_____ Date	_____ Lessor	_____ Date
_____ Lessee	_____ Date	_____ Lessee	_____ Date
_____ Agent	_____ Date	_____ Agent	_____ Date

ATTACHMENT B
RADON TESTING ANALYTICAL DATA

Site Radon Inspection Report

Date : 05/19/2014

Kevin Bogue
FACILITY SUPPORT SVCS., LLC
2685 State Street
Hamden, CT 06517-

Client: Unknown
Test Location: 91 Dogwood Lane
Easton, CT 06612-

Individual Canister Results

Canister ID# :	2313460	Test Start :	05/14/2014 @ 09:16
Canister Type :	Charcoal Canister 3 inch	Test Stop :	05/16/2014 @ 09:56
Location :	Basement- Boiler Rm-B	Received:	05/19/2014 @ 17:30
Radon Level :	0.1 pCi/L	Analyzed:	05/20/2014 @ 14:57
Error for Measurement is: ±	0.5 pCi/L		

Canister ID# :	2313493	Test Start :	05/14/2014 @ 09:16
Canister Type :	Charcoal Canister 3 inch	Test Stop :	05/16/2014 @ 09:56
Location :	Basement-Boiler Rm	Received:	05/19/2014 @ 17:30
Radon Level :	3.9 pCi/L	Analyzed:	05/20/2014 @ 15:38
Error for Measurement is: ±	0.5 pCi/L		

Canister ID# :	2313501	Test Start :	05/14/2014 @ 09:16
Canister Type :	Charcoal Canister 3 inch	Test Stop :	05/16/2014 @ 09:56
Location :	Basement-Boiler Room	Received:	05/19/2014 @ 17:30
Radon Level :	3.8 pCi/L	Analyzed:	05/20/2014 @ 15:53
Error for Measurement is: ±	0.5 pCi/L		

The reported results indicate that radon levels in the building tested are below the United States Environmental Protection Agency (EPA) action level of 4.0 picoCuries per liter of air (pCi/L). The EPA recommends retesting if your living patterns change and you begin occupying a lower level of the building, such as a basement or if major remodeling is done.

General radon information may be obtained by consulting the EPA booklet: A Citizen's Guide to Radon (www.epa.gov/radon/pubs/citguide.html). To request a copy or for further information, please contact your state health department. The EPA maintains a radon information website, including copies of its publications, at www.epa.gov/iaq/radon.

For New Jersey clients: Please see the attached guidance document entitled Radon Testing and Mitigation: The Basics for further information.

For New York clients: If the radon level of one or more testing devices is equal to or exceeds 20 pCi/L please contact the New York State Department of Health, Bureau of Environmental Radiation Protection, for technical advice and assistance at 518-402-7556 or toll free 1-800-458-1158.



Andreas C. George

Andreas C. George
Radon Measurement Specialist
NJ MES 11089

Dante Galan

Dante Galan
Laboratory Director

NRSB ARL0001
NYS ELAP ID: 10806
PADEP ID: 0346
NJDEP ID: NY933
NJ MEB 90036
FL DOH RB1609

Site Radon Inspection Report

Date : 05/19/2014

Kevin Bogue
FACILITY SUPPORT SVCS., LLC
2685 State Street
Hamden, CT 06517-

Client: Unknown
Test Location: 91 Dogwood Lane
Easton, CT 06612-
Individual Canister Results

PLEDGE OF ASSURED QUALITY

All procedures used for generating this report are in complete accordance with the current EPA protocols for the analysis of radon in air (EPA 402-R-92-004). The analytical results relate only to the samples tested, in the condition received by the lab, and that calculations were based upon the information supplied by client. RTCA and its personnel do not assume responsibility or liability, collectively and individually, for analysis results when detectors have been improperly handled or placed by the consumer, nor does RTCA and its personnel accept responsibility for any financial or health consequences of subsequent action or lack of action, taken by the customer or its consultants based on RTCA-provided results.



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SECTION 010000

SUMMARY OF WORK

General Conditions

The following provisions are intended to supplement and complement each other and shall, where possible, be thus interpreted. If, however, any provision of the Project Documents irreconcilably conflicts with one or more of the following provisions, the provision imposing the greater duty or obligation on the Contractor shall govern.

1. Contractor shall supply all materials (except where indicated), labor, tools, equipment, and supplies required to complete the total Project in accordance with the drawings, specifications and other Contract Documents. Prior to beginning Work, Contractor shall list any deficiencies in scope and report to the DOH.
2. Contractor shall provide all coordination of all Work with Owner, Owner Vendors, DOH, DOH Agencies as required for project completion.
3. Contractor will develop a comprehensive logistics plan for all activities that affect the Owner.
4. Contractor is responsible on a daily basis to submit a Daily Construction Report (DCR) indicating subcontractors, total number of people working, description of Work completed that day, total hours worked that day, and any major deliveries.
5. Contractor shall secure and pay for a dumpster for all refuse and waste material. The dumpster location will be determined by the property Owner.
6. If required for the Project (as reasonably determined by Owner) Contractor shall erect and maintain dust-barriers to separate living areas from areas of construction.
7. In the event of a required utility shutdown, Contractor will diligently schedule work with the Owner. Contractor will give the Owner Project Manager at least three (3) days advance notice of any proposed utility shutdown.
8. Contractor shall comply with all of the legal regulations, including, but not limited to, OSHA safety regulations and regulations of municipal, city, local, and other government agencies having jurisdiction concerning the Work. Contractor shall give all notices and comply with all laws, ordinances, codes, rules and regulations bearing on the conduct of the Work. If Contractor performs any Work that is contrary to such laws, ordinances, codes, rules, and regulations, it shall make all changes to comply therewith and bear all costs arising therefrom.

9. All permits, required for any part of Contractor's Work, including those to be obtained in the Owner's name, shall be procured and paid for by Contractor.

GENERAL SCOPE

1. Inspect all areas, including those not affected by the repair scope, for damage to the finishes, fixtures, appliances, furnishings, etc. Document and report any and all damage to Owner for acceptance, and to DOH for notice, prior to commencing work.
2. Furnish and install any temporary supports or bracing as required to properly complete the work.
3. Provide all floor preparation as required including any flashing, skimming, or patching to provide for a suitable substrate for flooring work.
4. Contractor is responsible to detach and reset any items to properly perform all work, including but not limited to: trim, hardware, fixtures, door slabs, electrical components, mechanical components, etc.

PROJECT SCOPE

1. GUTTERS & DOWNSPOUTS

- 1.1. Furnish and install gutter at missing roof eave location.
 - 1.1.1. Clean and make proper connections to existing gutter system.

2. INSULATION

- 2.1. Remove and dispose of damaged insulation as required to complete work and indicated on drawings.
- 2.2. Furnish and install new fiberglass insulation in ceilings.
 - 2.2.1. R-value to meet 2009 International Energy and Conservation Code Requirements.

3. ARCHITECTURAL WOODWORK

- 3.1. Remove and dispose of wall paneling and matching wood doors and trim in finished basement area.
- 3.2. Remove and dispose of kitchen countertops, base cabinetry and upper cabinetry.
- 3.3. Furnish and install wall paneling and matching doors and trim where removed in basement.
- 3.4. Furnish and install new kitchen countertops, base cabinetry and upper cabinetry.
 - 3.4.1. Provide coordination of new materials, finishes, and hardware with homeowner.
- 3.5. Furnish and install new exterior fascia board at damaged location.

3.5.1. Make any necessary repairs to soffit framing and soffit vent as required.

3.6. Furnish and install crown molding as indicated on drawings.

3.6.1. Coordinate with homeowner for style.

4. FINISHES

4.1. Remove and dispose of suspended ceiling tile system in the mud room and finished basement area.

4.2. Remove wall tile in kitchen and floor tile in finished basement storage areas.

4.3. Remove and dispose of finished ceilings in office, bathroom, and kitchen.

4.4. Remove and dispose of plaster walls in kitchen.

4.5. Remove hardwood flooring throughout main level.

4.5.1. Detach, store, and re-install doors, trims and casings as required.

4.6. Remove vinyl tile flooring in mud room.

4.6.1. Detach, store, and re-install doors, trims, and casings as required.

4.7. Furnish and install new 1/2" gypsum board ceilings and gypsum board walls where required.

4.7.1. Provide taping of gypsum board.

4.8. Furnish and install new suspended ceiling tile system where removed.

4.9. Furnish and install new vinyl tile flooring in mudroom and kitchen.

4.9.1. Provide all require floor preparation for proper install.

4.9.2. Replace any plywood subflooring in kitchen for proper finish floor installation.

4.10. Furnish and install new wall tile in kitchen and floor tile in basement as required.

4.11. Furnish and install new hardwood flooring to match existing material.

4.11.1. Sand and finish new flooring to match existing.

4.12. Prime and paint new gypsum board ceilings, walls, trim, and exterior fascia board as required.

4.12.1. Detach, store, and re-install wall hangings, window treatments, hardware, fixtures, etc. as required

5. ROOFING

5.1. Inspect roofing system including all flashing, drip edge, sheathing, and roofing membrane.

Repairs made to roofing system completed without a building permit after tree impact and storm damage.

5.1.1. If roofing deficiencies in roofing system are identified submit work plan to repair deficiencies to Martinez, Couch and Associates.

5.1.2. If no deficiencies are found, obtain retroactive building permit for roofing repairs completed for storm damage.

6. ROUGH CARPENTRY

- 6.1. Sister-in or replace six (6) damaged roof joists. Provide all supports, labor and materials necessary for completion of work.
- 6.2. Sister-in or replace two (2) damaged floor joists. Provide all supports, labor and materials necessary for completion of work.

7. MECHANICAL/PLUMBING

- 7.1. Provide all work, materials, and labor in accordance with divisions 22 00 50, 22 00 60, 22 10 60, and 23 00 60 and Drawings.

8. ELECTRICAL

- 8.1. Provide all work, materials and labor in accordance with divisions 26 00 50 and 26 00 60 and Drawings.

9. ENVIRONMENTAL

- 9.1. Provide all necessary work, labor and materials required for Division 02 82 12 – Asbestos Abatement Specification.
- 9.2. Provide all necessary work, labor and materials required for Division 02 83 13 – Lead Hazard Remediation.
- 9.3. Provide all necessary work, labor and materials required for Division 02 85 00 – Mold Remediation.

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 - RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Specification Sections, apply to this Section.

1.2 - SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 000115 "List of Drawings Sheets"

1.3 - DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Martinez Couch & Associates LLC (MCA) is the Project Manager and for this project. MCA will provide technical consultation, review of all materials, and project management. All references in this specification and in all other specifications references, MCA is Martinez Couch & Associates.
 - 1. All submittals shall be mailed to:
Martinez Couch & Associates
1084 Cromwell Avenue

Rocky Hill, CT 06067
Phone Number: (860) 436-4364
Fax Number: (860) 436-4626

- E. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

All submittals shall be submitted in PDF via electronic mail (email) to

1. recouch@martinezcouch.com
2. mranando@martinezcouch.com

1.4 - ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by MCA and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 10 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 4. Format: Arrange the following information in a tabular format:
 - a. Add information, such as scheduled dates for purchasing and installation and the activity or event number, if using a CPM construction schedule.
 - b. Scheduled date for first submittal.
 - c. Specification Section number and title.
 - d. Submittal category: Action; informational.
 - e. Name of subcontractor.
 - f. Description of the Work covered.
 - g. Scheduled date for MCA final release or approval.
 - h. Scheduled date of fabrication.
 - i. Retain three subparagraphs below if CPM construction schedules are required.
 - j. Scheduled dates for purchasing.
 - k. Scheduled dates for installation.

1. Activity or event number.

1.5 - SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. MCA's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Engineer for Contractor's use in preparing submittals.
 - a. Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Engineer and to Engineer's consultants, allow 15 days for review of each submittal. Submittal will be returned to Engineer before being returned to Contractor.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.

3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of subcontractor.
 - g. Name of supplier.
 - h. Name of manufacturer.
 - i. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Other necessary identification.
4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will discard submittals received from sources other than Contractor.
 - a. Transmittal Form for Paper Submittals: Use AIA Document G810.
 - b. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
 - 1) Project name.
 - 2) Date.
 - 3) Destination (To:).
 - 4) Source (From:).
 - 5) Name and address of Engineer.
 - 6) Name of Contractor.
 - 7) Name of firm or entity that prepared submittal.
 - 8) Names of subcontractor, manufacturer, and supplier.
 - 9) Category and type of submittal.
 - 10) Submittal purpose and description.
 - 11) Specification Section number and title.
 - 12) Specification paragraph number or drawing designation and generic name for each of multiple items.
 - 13) Drawing number and detail references, as appropriate.
 - 14) Indication of full or partial submittal.
 - 15) Transmittal number numbered consecutively.
 - 16) Submittal and transmittal distribution record.
 - 17) Remarks.
 - 18) Signature of transmitter.

- E. Options: Identify options requiring selection by Engineer.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer action stamp.

PART 2 - PRODUCTS

2.1 - SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. MCA will return two copies.
 - 2. Informational Submittals: Submit paper copies of each submittal unless otherwise indicated. Engineer will not return copies.
 - 3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:

- a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. Three paper copies of Product Data unless otherwise indicated. Engineer will return two copies.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal based on Engineer's digital data drawing files is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm)
 3. Retain subparagraph below unless default submittal format specified elsewhere in this article applies.
 4. Submit Shop Drawings in the following format:
 - a. Three opaque copies of each submittal. Engineer will retain two copies; remainder will be returned.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:

- a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
- a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
- a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line to Engineer. Engineer will provide sample to property owner for their use to select option to be used.
5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
- a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line to Engineer. Engineer will provide sample to property owner for their use to select option to be used.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule in the following format:
 - a. Three paper copies of product schedule or list unless otherwise indicated. Engineer will return two copies.

- F. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Engineers and owners, and other information specified.
- G. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- H. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- I. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- J. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- K. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- L. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- M. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- N. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- O. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed

before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

- P. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

2.2 – DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 - CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 - ENGINEER'S ACTION

- A. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
1. Action Code 1 - No Exceptions Taken

2. Action Code 2 - Correct as Noted
 3. Action Code 3 - Revise and Resubmit
 4. Action Code 4 - Rejected
- B. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Engineer.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Engineer without action.

END OF SECTION

SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. General: During the construction period various types of services are necessary to record or support the construction process, which are not an integral part of the final construction. Provide temporary facilities and controls in accordance with the Contract Documents.

- B. Scope of Work includes but is not limited to:
 - a) Layout and measurements.
 - b) Staging areas.
 - c) Rubbish removal.
 - d) Safety, protection and security.
 - e) Temporary toilets.
 - f) Water Service
 - g) Temporary scaffolding, ladders, stairs, hoists, etc.
 - h) Site fence.
 - i) Temporary closures
 - j) Labor disputes
 - k) Temporary light and power
 - l) Temporary heat
 - m) Ventilation and Humidity Control

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

- B. Ladders, scaffolds, planks, hoists and similar items required for a specific item of work shall be part of that Scope of Work

1.3 QUALITY ASSURANCE

- A. Codes: Comply with applicable Building Code and Standards.

- B. Standards: Comply with the State and Local Board of Health, Environmental Protection Agency, Fire Department and other applicable standards.

- C. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- D. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.4 SUBMITTALS

- A. Refer to Section 01330 or certain individual items of this section.

1.5 PRODUCT HANDLING

- A. Maintain temporary facilities and controls in proper safe condition throughout progress of the Work.

1.6 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

PART 2 - PRODUCTS AND EXECUTION

2.1 TEMPORARY FACILITIES INSTALLATION

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to Martinez Couch and Associates, testing agencies, and authorities having jurisdiction.
- B. Layout and Measurements:
 - 1. Use of Data Furnished: Boring, and survey data made available to the Contractor is for information only, and the Contractor shall use his own judgment as to the actual conditions. He is warned that reliance on the information presented is at his own risk, and neither the Owner, State, nor the Engineer and his consultants will be liable for errors relating to such data.
 - 2. Additional Data Required By Contractor: The Contractor may make borings or drive test pits he requires to verify the conditions at the site at his own expense. The location and size of such exploratory holes will be subject to approval by the Engineer.

3. Protection of Survey: Land monuments, bench marks, survey points and other such references shall be protected from damage unless and until their removal is authorized. If they are disturbed, they shall be replaced in their proper positions.
 4. Measurements: Take measurements of the work and be responsible for it.
 - a. Discrepancies: Thoroughly examine the drawings and specifications, carefully checking the figured dimensions, before commencing work, and report to the Engineer if any discrepancy, error, or defect appears.
 - b. Dimensions: If figured dimensions are lacking on the drawings, the Engineer will supply them.
- C. Staging Area:
1. Scope: Access and staging areas for purposes of this Contract shall be confined to areas as directed by the Owner or Engineer within the property boundary.
 2. Location of Apparatus: The locations of material, apparatus, equipment, fixtures, piping outlets, etc., are not specified. The actual location shall be as directed or as required to suit the conditions at the time of installation. Before installation, the Contractor shall consult the Engineer and ascertain the actual location.
 3. Provide temporary storage sheds if necessary, and other storage facilities on the job site for the storage of materials that may be subject to weather damage when interior or covered space is not available.
 4. Provide for adequate timber bridging and planking or other suitable means as required for legal egress, and for the safeguarding of existing paving, walks and curbs, structures and utilities from damage due to construction vehicle traffic. Safeguard existing conditions from damage during construction. Repair or replace the damaged existing surroundings within the designated access and staging areas which is needed to remain in place and which is damaged by operations under this Contract.
 5. Do not encumber the premises nor overload the structures beyond their allowable design live load with his/her apparatus, storage of materials and the operation of his/her workmen, and shall be confined within the limits designated by the Owner or Engineer.
- D. Rubbish Removal:
1. Clean-up debris, rubbish and old materials resulting from the Work on a daily basis.
 2. Cleaning Responsibility: Remove from the work area of building and site debris, resulting from the work daily or as often as necessary if it interferes with the work or staging area under the contract or presents a fire hazard. No rubbish or debris shall be dropped from a height of more than 6 feet, or thrown out of windows or openings without a chute. An adequate number of cleaning personnel shall be provided during working hours, who shall keep areas within and adjacent to the building free from dust and loose dirt by sweeping and wet mopping.
 3. Rubbish Disposal: Furnish containers at central collection locations as designated by the Owner or Engineer on the site to receive construction debris. Cost of containers, removal and disposal charges shall be paid by the Contractor. Containers shall be removed as often as necessary to minimize interference with work in progress.
 4. Clean the site around the building and maintain it clean and free from food and beverage containers, waste and other debris. Provide and rigidly enforce the use of waste receptacles by construction personnel. Burning of refuse is not permitted.

5. **Salvage Materials:** Construction salvage materials, not indicated items elsewhere to be returned to the Owner, shall become the property of the Contractor and shall be taken from the premises. Storage of materials and equipment on the site, other than for this project, will not be permitted.
- E. **Safety, Protection and Security:**
1. Provide safety and protection in accordance with Contract Documents.
 2. **Protection:** Protection shall be maintained for the duration of the Project and shall include:
 - a. **Weather Protection:** Arrange to provide protection against rain, wind, storms, frost, heat and other weather conditions, so as to maintain work, materials, apparatus and fixtures free from injury or damage. At the end of each day's work items likely to be damaged shall be covered. Remove snow and ice for the proper protection and/or execution of the construction work.
 - b. **Protection of Finished or Existing Work:** Provide protection for the finished work. Finished or Existing floors that will remain shall be protected from traffic or construction work by covering with materials approved by the finish manufacturer. Finished construction and materials shall be protected from rain, snow and windstorm damage throughout the construction period.
 - c. **Fire Protection:** Maintain fire-fighting equipment for the duration of construction in accordance with the requirements of the Fire Department and the Insurance Underwriters and subject to approval of the Owner's insurance agent. Provide fire extinguishers as required by the local Fire Department and the Building Code. Coordinate with existing firefighting equipment in existing building.
 - d. **Volatile Liquids:** Bulk storage of volatile liquids shall be outside the building at designated location. Only as much volatile liquid shall be allowed within the building at any given time as is needed for that day's operation.
 - e. **Vermin and Rodent Control:** Prevent the infestation and multiplication of vermin and rodents, and, if necessary, employ an exterminator to rid the premises of them if there is evidence that they exist.
 - f. **Dust Protection:** Prevent the nuisance of dust to the surrounding areas, and provide coverings or water sprinkling materials and equipment as required for such dust prevention for the work.
 - g. **Structural Alterations:** Do not permit endangering work by excavation or otherwise and shall not cut or alter the work without the consent of the Structural Engineer. Written instruction shall be obtained from the Structural Engineer's representatives before cutting beams or other structural members, arches, lintels, etc.
 3. **Protection of Adjacent Property:**
 - a. **Scope:** Take necessary precautions to protect public and private property on or adjacent to the job site, including utilities, street signs, light standards, hydrants, pavements and walks, planting and natural features, against damage or injury including settlement or collapse.

- b. **Building Damage:** Should damage result to structures or property, the Contractor shall correct or repair it without undue delay and to the complete satisfaction of the Owner. No "Waiver of Responsibility" for incomplete, inadequate or defective adjoining work will be accepted unless otherwise stated by the Engineer.
 - c. **Excavation Damage:** Maintain the existing and adjoining structures safety. Concrete or rock excavation in the proximity of the adjoining structures shall be done by line drilling. Existing footings and foundation work exposed shall be underpinned as directed by Engineer. Prevent damage to pipes, conduits, wires, cables or structures above or below ground.
 - d. **Site Damage:** Repair and restoration of existing roads, pavements, walks, curbs, manholes, hydrants, light standards, street signs, catch basins, railings and plantings, and other construction or surfaces required due to the work under this contract shall be included in the work under the Contract even if not specifically called for in the various sections of the Specifications. Repair and restoration work shall match existing work. Costs incurred in repair work, including permits, bonds and supervision by public authorities, shall be borne by the Contractor causing the damage.
4. **Welding & Cutting:**
- a. **Handling of Welding Materials:** The handling and storage of welding materials, acetylene and oxygen tanks, burners, and other equipment required for the execution of welding and cutting work at the job shall be subject to the approval of the Building Department and Fire Marshal.
 - b. **Welding Standards:** Work shall be performed in accordance with the standard specifications of the American Welding Society.
 - c. **Fire Protection:** Welders shall take precautions required to prevent fires as a result of his/her operations. When welding tools or torches are in used, the Contractor shall have available, in the immediate vicinity of the work, a fire extinguisher of the CO₂ type. The fire extinguisher shall be provided and maintained by the Installer. Fuel for cutting and heating torches shall be gas only, and shall be contained in Underwriters Laboratory listed containers. Storage of gas shall be in locations approved by the Fire Department. Provide fireproofed tarpaulins where applicable at welding and cutting operations.
 - d. **Power:** The Owner will not provide power for electric welders.
5. **Tree Protection:** Trees identified by the Owner or Engineer to remain must be protected by the Contractor during the construction period. Avoid driving vehicles or storing materials within the tree root area and excavating in the root area unless accepted by the Owner or Engineer.
6. **Security:** The Contractor shall secure his/her tools, materials and assemblies. Claims shall not be made against the Owner or Engineer for equipment or tool losses or damage to installed assemblies.

F. **Temporary Toilets:**

1. Chemical Toilets: The Contractor shall provide and maintain temporary enclosed and weatherproof chemical toilets located on the site. Use of the owner's toilets by construction personnel within occupied areas of the building is not permitted.
 2. Cleaning of Toilets: Toilets shall be maintained in a clean and sanitary condition and shall conform to the requirements of the local Department of Health and Labor requirements. Toilets shall be pumped and cleaned a minimum of once per week.
- G. Water Service:
1. Water shall be available for the various trades as coordinated with the property Owner. Prevent freeze-ups. Have water available for the various trades during the normal working periods and for fire prevention purposes.
 2. Cost: the Owner shall pay the cost of water.
- H. Temporary Scaffolding, Ladders, Stairs, Hoists, Etc.:
1. Scope: Coordinate the installation and maintenance and safety of temporary stairs, ladders, ramps, scaffolds, runways, sidewalk bridges, fences, derricks, hoists, chutes, and other such operational facilities as may be needed for the proper execution of the work. Apparatus, equipment and construction shall meet the requirements of the Labor Law and other State and local Building Department Requirements.
 2. Scaffolding: Coordinate the location, erection, maintenance and removal of scaffolding and other temporary facilities as required for the proper installation of the work.
 3. Hoists and/or Crane: (for General Use) Coordinate and maintain the use of conventional construction hoists of sufficient size and capacity to raise materials and equipment and give access to construction levels.
- I. Site Fence, if applicable:
1. Location: A site fence shall be installed by the Contractor at the construction site perimeter and adjacent staging areas if required by the contract documents. New construction work, including trailer and staging shall be contained within the site fence.
 2. Type: Provide either of the following types:
 - a. Woven Wire Mesh: 6'-0" high with gates and required bracing.
 - b. Maintain fence and gates during entire construction period in a neat and orderly way free of graffiti or unauthorized signs.
- J. Temporary Closures:
1. Take special precautions against damage to materials and work installed in cold or freezing weather, by providing adequate special heat and/or covering to prevent damage by the elements.
 2. Temporary Partitions: (adjacent to occupied areas) after relocation of occupancy from spaces requiring access, provide temporary partitions to isolate occupied areas from work areas. Temporary partitions shall be of gypsum board on suitable studs and shall not interfere with the emergency exit requirements of occupied areas.
 3. Exterior partitions shall be suitably weather protected insulated and otherwise sealed off to prevent dirt and weather infiltration.
 4. Interior partitions shall be suitably sealed to limit noise and dirt infiltration.

K. Labor Disputes:

1. Notifications: Immediately notify the Engineer of actual or impending labor disputes that may affect or is affecting the schedule of the Work. Take appropriate measures to eliminate or minimize the effect of such labor dispute on the schedule, including but not limited to, such measures as: promptly seeking appropriate injunctive relief; filing appropriate charges with the National Labor Relations Board under the applicable provisions of the Labor Management Relations Act of 1947, as amended; filing appropriate damage actions; taking such measures as establishing a reserved gate, where appropriate; seek other sources or supply or service; and other measures that may be appropriately utilized to limit or eliminate the effect of the labor dispute.
2. Damage - Time Extension: To the extent the Contractor fails to promptly initiate measures that are appropriate, no extension of time for completion shall be allowed. In addition, any delay impact on any Contractor's schedule or on the schedule for the Project, which is a direct result of such failure, shall be considered as a Contractor caused delay under applicable provisions of the Contract. The rights and remedies provided in this paragraph are in addition to other rights or remedies provided by law or under this Contract. The Contractor shall include this clause in every Contract, together with a requirement that Sub-Subcontractors include a substantially similar clause in each lower tier subcontract.

L. Temporary Light and Power:

1. Scope: The Contractor shall provide labor, materials, tools, appliances, and equipment and perform operations necessary for the complete execution of a separate system of temporary electric light and power throughout the project suitable for supplying electrical energy for illumination and for power tools and equipment. Such system shall be installed and maintained in place as needed and removed promptly as its necessity ceases to exist. Maintaining shall and include energizing and de-energizing the electrical systems each working day, and turning on and off of lights daily.
- 2.
3. Lighting Standards: The minimum temporary lighting to be provided, and maintained in each room and changed as needed when interior walls are being erected as directed by OSHA standards. Temporary lighting must be maintained for twenty-four (24) hours a day, and seven (7) days a week at stairs and corridors below ground. In other spaces, temporary lighting and power shall be energized approximately thirty (30) minutes before the starting time and after the quitting time of the latest stopping unless otherwise directed by code.
4. Wiring Standards: Temporary wiring and equipment shall conform to the requirements of the National Electrical Code, regulations of the Building Code.
5. Energy Costs: The Owner shall pay the Electric Utility bills, as they become due, for electric energy used for temporary lighting and power to perform work in the building.
6. Other Costs: The Contractor responsible for the other costs in connection with providing and maintaining the temporary electrical power system.

M. Temporary Heat:

1. Scope of Enclosed Building Protection: Prior to the winter weather protection as required to accomplish the following:
2. To protect the finish work.
3. If the heat not available from existing heating plant, the Contractor is responsible to provide sufficient heat so that the work can be accomplish in accordance with the Contract.
4. Cost: If the other than existing plant used for heat the Contractor shall pay for temporary heat equipment, safety provisions and fuel charges.
5. Damage Due to Lack of or Improperly Operated Temporary Heat: Maintain heat to prevent damage due to frost and freezing during the period when temporary heat is needed. Prevent damage due to defective equipment or the use of equipment, including but not limited to damage such a stains, smudges, soot or fire, and repair damage in a manner satisfactory to the Owner and Engineer.

N. Ventilation and Humidity Control (Where necessary for project work): Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

2.2 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

2.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."
- B. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- C. Barricades and Warning Signs: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs.
- D. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- E. Prohibit smoking in construction areas.
- F. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

2.4 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.
 4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard, replace, or clean stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use temporary dehumidifiers or permanent HVAC system, if available to control humidity.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

2.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 1. Materials and facilities that constitute temporary facilities are property of Contractor.
 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

The State of Connecticut Department of Housing
Community Development Block Grant
Disaster Recovery Program (CDBG-DR)
Owner Occupied Rehabilitation and Rebuilding Program

Bid Documents
Project# 1111
91 Dogwood Drive
Easton, CT

3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Substantial Completion Procedures.
- B. Final Completion Procedures.
- C. Requirements for Operating and Maintenance Manuals.
- D. Requirements for Warranties.
- E. Requirements for Commissioning , Testing, and Inspection Records.
- F. Final Cleaning.

1.2 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Manufacturer's data sheets on each cleaning product to be used, including:
 - 1. Material descriptions, dimensions, and profiles.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Application methods.
- C. Material Safety Data Sheets (MSDS), where applicable.
- D. Contractor's List of Incomplete Items.
- E. Certified List of Incomplete Items.
- F. Labor Warranties.
- G. Product Warranties.
- H. Product Operating and Maintenance Manuals.
- I. Project Records: Commissioning, Testing, and Inspection Records.
- J. Owner Acceptance Letter.

1.3 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's Punch List), indicating the value of each item on the list and reasons why the work is incomplete.

- B. Submittals Prior to substantial Completion: Complete the following prior to requesting inspection for determining date of substantial completion. List items below that are incomplete at time of request.
 - 1. Submit closeout submittals, including project record documents, operation and maintenance manuals, warranties, final certifications, and similar final record information.
- C. Procedures prior to Substantial Completion: Complete the following prior to requesting inspection for determining date of substantial completion. List items below that are incomplete at time of request.
 - 1. Instruct owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 - 2. Terminate and remove temporary facilities from project site, along with mockups, construction tools, and similar elements.
 - 3. Complete final construction cleaning (broom sweep), including touch up painting.
 - 4. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

1.4 FINAL COMPLETION PROCEDURES

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
 - 1. List of incomplete items: Submit certified copy of architect substantial completion inspection list of items to be completed or corrected (punch list), endorsed and dated by architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
- B. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, architect will either proceed with inspection or notify contractor of unfulfilled requirements. Architect will prepare a final certificate for payment after inspection or will notify contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Request reinspection when the work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment's, and building systems.
 - 3. Submit list of incomplete items, including item values, in MS excel electronic file format.

1.6 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of submittal: Submit written warranties on request of architect for designated portions of work where commencement of warranties other than date of substantial completion is

indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

- B. Warranty documents to be provided to Owner in hard copy format. Photo copies or scanned PDF versions of the warranty documents shall be provided to architect for file submission to

PART 2 PRODUCTS

2.1 CLEANING AGENTS AND MATERIALS, GENERAL

- A. Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished or unfinished surfaces.

PART 3 EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average residential building. Comply with manufacturer's written instructions.
 1. Clean project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 2. Remove tools, construction equipment, machinery, and surplus material from project site.
 3. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 4. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 5. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damages transparent materials.
 6. Remove labels that are not permanent.
 7. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 8. Leave project clean and ready for occupancy.

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of final completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be

repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
3. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Demolition and removal of selected portions of building or structure.
- B. Demolition and removal of selected site elements.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. State of Connecticut Department of Energy and Environmental Protection (CTDEEP).
- C. State of Connecticut Department of Environmental Protection (CTDEP).
- D. State of Connecticut Department of Public Health (CTDPH).
- E. Occupational Safety and Health Administration (OSHA).

1.3 SUBMITTALS

- A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.4 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work unless otherwise noted in the contract documents.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed per the written directive of the CTDOH and under separate specification.
- C. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that utilities scheduled to remain have been properly protected before starting selective demolition operations.
- B. Verify that utilities scheduled to be removed have been disconnected and capped before starting selective demolition operations.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

3.3 PREPERATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent properties.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent properties.
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations

of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces.
 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 3. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 4. Dispose of demolished items and materials promptly.
- B. Removed and Reinstalled Items:
1. Clean salvaged items.
 2. Store items in area as coordinated with Owner.
 3. Protect stored items until reinstallation.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for intended use.
- C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Disposal: Transport demolished materials off Owner's property and legally dispose of them at a licensed transfer station.

3.6 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

The State of Connecticut Department of Housing
Community Development Block Grant
Disaster Recovery Program (CDBG-DR)
Owner Occupied Rehabilitation and Rebuilding Program

Bid Documents
Project# 1111
91 Dogwood Drive
Easton, CT

SECTION 02 82 13

ABATEMENT OF ASBESTOS CONTAINING MATERIALS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. “Asbestos Abatement Specification, 91 Dogwood Drive, Easton, CT 06612”

PART 2 - PRODUCTS

PART 3 - EXECUTION

All work, labor, and materials shall conform to “Asbestos Abatement Specification, 91 Dogwood Drive, Easton, CT 06612” prepared by Chris Hudacek CT DPH Asbestos Project Designer License #000239



Facility Support Services, LLC

Environmental & Safety Consulting Engineers

May 5, 2014

FSS PN: 22214

Martinez Couch & Associates, LLC
Attn: Mr. Matthew Ranando
1084 Cromwell Ave. Suite A-2
Rocky Hill, CT 06067

**RE: Specifications: Asbestos Abatement
91 Dogwood Drive
Easton, Connecticut 06612**

Dear Mr. Ranando:

Enclosed please find the Specifications for Asbestos Abatement (Section 02080) and associated work to support the asbestos abatement of asbestos containing materials to facilitate renovations of a single family home located at 91 Dogwood Drive in Easton, Connecticut. These Specifications have been prepared to satisfy the requirements of standards for asbestos abatement in the State of Connecticut.

If you have any questions regarding these Specifications, please contact the undersigned at our Hamden, CT office at (203) 288-1281. Thank you for this opportunity to have served your environmental needs.

Sincerely,

Facility Support Services, LLC (FSS)

A handwritten signature in blue ink, appearing to read "C. M. Hudacek".

Christopher M. Hudacek
Project Manager
CTDPH Project Designer #000239

Enclosure



Facility Support Services, LLC

Environmental & Safety Consulting Engineers

ASBESTOS ABATEMENT SPECIFICATIONS

**91 DOGWOOD DRIVE
EASTON, CONNECTICUT 06612**

Prepared For:

**Martinez Couch & Associates, LLC
1084 Cromwell Avenue
Suite A-2
Rocky Hill, Connecticut 06067**

Prepared By:

**Facility Support Services, LLC
2685 State Street
Hamden, Connecticut 06517**

**Christopher Hudacek
CTDPH Project Designer #000239**

April 5, 2014

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	Section 01016	Scheduling and Phasing
	Section 01026	Unit Prices
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	Section 02080	Asbestos Abatement

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Contractor Qualifications.
- B. Contractor Use of Site and Premises.
- C. Work Sequence.
- D. Owner's Operations.
- E. Closeout and Punch List.
- F. Cleaning.
- G. Emergency Calls

1.2 CONTRACTOR QUALIFICATIONS

- A. The Contractor selected must appear on the approved list of Asbestos Abatement Contractors on file at the State of Connecticut Department of Public Health (CTDPH). Only State of Connecticut licensed asbestos abatement supervisors and workers shall perform asbestos abatement work activities.
- B. The Contractor shall obtain and pay for all required permits, and prepare and file any original and amended local forms immediately following award of the work.
- C. The Contractor shall conduct personal exposure air monitoring for airborne fibers as prescribed by OSHA during the project performance.
- D. The Owner reserves the right to award this Contract to the Contractor who best meets all contractor qualifications and Owner's interests.

1.3 CONTRACTORS USE OF SITE AND PREMISES

- A. Limit use of site and premises as follows:
 - 1. Owner occupancy.
 - 2. Work by Owner.
 - 3. Use of site and premises by public.
- B. Coordinate use of the premises, including use of utilities under direction of Owner and in accordance with local ordinances.

- C. Assume full responsibility for protection and safekeeping of products under this Contract.

1.4 WORK SEQUENCE

- A. Work must be performed to accommodate Owner's requirements and work by other trades. Coordinate abatement schedule and operations with the Owner and Consultant. Re-occupancy by owner and other trades shall occur following completion of work by the Contractor and successful air clearance sampling by the Consultant.
- B. The Owner will not occupy the building during the Work.

1.5 CONTRACTOR'S OPERATIONS

- A. Maintain means of egress.
- B. Coordinate Work with the Owner.
- C. Maintain the fire alarm and fire detection systems at all times during project.
- D. Maintain a permanent means of egress during activities. Provide and maintain a temporary means of egress as required by the Fire Marshall.

1.6 CLOSEOUT AND PUNCH LIST

- A. The Contractor shall carefully check his/her own work and that of any Subcontractor as the work is being performed. Unsatisfactory work shall be corrected immediately.
- B. When the Contractor determines that he is substantially complete, that is, has less than one percent of his Contract remaining to be completed, he shall prepare for submission to the Consultant, a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents.
- C. Upon receipt of the Contractor's list of items to be completed or corrected, the Consultant will promptly make a thorough inspection and prepare a "punch list" setting forth in accurate detail any items on the Contractor's list and any additional items that are not acceptable.
- D. When the "punch list" has been prepared, the Consultant will arrange a meeting with the Contractor to identify and explain all punch list items and answer questions on the work that must be completed before final acceptance.

- E. The Contractor shall correct all “punch list” items or shall cause the correction of the “punch list” items within a time frame to be established when the “punch list” is made. The time frame for the completion of the “punch list” shall not exceed the completion date of the Contract. Should the “punch list” not be completed within the specified time frame, the Owner may invoke the rights given under the General Conditions.
- F. The Consultant shall not be expected to inspect any area more than once for the preparation of the “punch list” items. If, during an inspection, the Consultant discovers five (5) or more deficient conditions, then the area shall be declared “Not Ready” for Inspection.
- G. All inspections and sampling required for asbestos abatement compliance will be performed by the Consultant.

1.7 CLEANING

- A. Throughout the abatement period, the Contractor shall maintain the building and site free of rubbish, debris, surplus materials, and other items not required for the Work. Remove such materials from the site daily to prevent accumulations. Remove all construction debris from work areas, and remove all hazardous waste and asbestos waste as required by the most current federal, state, and local regulations and the requirements of the specifications.

1.8 EMERGENCY CALLS

- A. The Contractor shall provide the Owner with a telephone number where the Contractor or Contractor's Representative can be reached during non-working hours.
- B. At the direction of a duly authorized representative of the Owner, the Contractor may be required to dispatch all necessary personnel and equipment to any point on the work site to clear obstructions or make safe any conditions deemed necessary by the Owner or Consultant.

1.9 ADDITIONAL GENERAL REQUIREMENTS

- A. The Abatement Contractor shall employ an English-speaking competent Asbestos Abatement Supervisor with at least three (3) years experience on projects of similar scope and magnitude who shall be responsible for all work involving asbestos abatement as described in the Specifications and defined in the applicable regulations, and have full-time daily supervision of the same. The Supervisor shall be the “Competent Person” as defined by OSHA regulations. The Contractor shall provide, on-site, at least one English-speaking foreman at all times when work is in progress. The supervisor and foreman must be thoroughly experienced in asbestos-containing materials removal work, knowledgeable of all applicable federal, state, and local regulations and capable of skillfully executing all work promptly, efficiently and in compliance with all requirements of these specifications. The Owner reserves the right to have any supervisory or foreman personnel removed from the project if they do not demonstrate the requisite qualifications.
- B. The Contractor shall allow work performed under this contract to be inspected, if required, by local, state, federal, and any other authorities having jurisdiction over such work. The Contractor shall immediately notify the Owner and shall maintain written evidence of such inspection for review by the Owner.
- C. The Contractor shall incur the cost of all fines resulting from regulatory non-compliance as issued by federal, state, and local agencies. The Contractor shall incur the cost of all work requirements mandated by federal, state, and local agencies as a result of regulatory non-compliance or negligence.
- D. The Contractor shall immediately notify the Owner of the delivery of all permits, licenses, certificates of inspection, approval or occupancy, etc., and any other such instruments required under codes by authorities having jurisdiction, regardless of to who issued, and shall cause them to be displayed to the Owner and Consultant for verification and recording.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The Contractor shall present a working schedule to the Owner. Variations, amendments, and corrections to the schedule will be discussed, and the Owner will inform the Contractor of additions or changes in the scheduling requirements for the project.
- B. The Contractor shall submit any revised schedule no later than three days following initial schedule submission. Upon approval from the Owner, the Contractor will receive a “Notice to Proceed” with the work of the Contract.
- C. Any subsequent changes in the work schedule must be approved by the Owner
- D. Refer to all other applicable sections of the specification for coordination with other trades. The Contractor shall coordinate work with all other activities at this occupied site.

1.2 TIME FOR COMPLETION AND WORKING HOURS

- A. Upon award of contract from the Owner, the Contractor shall immediately order materials, supplies, and components for the work of this project.
- B. The Contractor shall begin the work immediately upon receipt of the written “Notice to Proceed” from the Owner. The date of the commencement of the work is termed the “Abatement Start Date.” The Contractor will be required to complete all work of this Contract within the time period stipulated in the finalized schedule. The last day in the schedule is termed as “Contract Completion Date”.
- C. If conditions arise that are beyond the control of the Contractor and force delays in the performance of the Work, the Owner shall immediately be notified. The Contractor shall state the reason for the delay and shall estimate the expected duration of the delay. Any application for an extension of the Contract completion date shall be made under proper change order procedures. The acceptance of the cause for delay and change order is subject to the Owner's review and approval.
- D. Work hours will be established in coordination with the Owner.
- E. Any extra hours or days per week worked by the Contractor or Sub-Contractors shall be at no extra cost to the Owner. Denial of extra hours or days per week by the Owner shall not be grounds for extra time allotted to the overall Contract time.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 – GENERAL**1.1 SUMMARY**

- A. A unit price is an amount proposed by the Contractor and stated on the proposal as a price per unit of measurement for materials or services that will be added to or deducted from the Contract Sum by Change Order in the event the project Scope of Work is altered.

- B. Unit prices include material, any direct or indirect expenses of the Contractor or Sub-Contractor, profit, insurance, bonding, and any applicable taxes. The same unit price shall apply whether the work is added or deducted.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 FINAL CLEANING

- A. Unless otherwise specified under Sections of this Specification, the Contractor shall perform final cleaning operations specified prior to final inspection.
- B. Maintain the project site free from accumulations of waste, debris and rubbish caused by operations. At the completion of the work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave the project clean and ready for work of others under separate contract.
- C. Cleaning shall include all surfaces, interior and exterior, in which the Contractor has had access.
- D. Use only those materials that will not create hazards to health or property.

1.3 ABATEMENT CLOSEOUT DOCUMENTS

- A. Submit to the Owner, final completed copies of the Waste Shipment Records, signed by all transporters and the designated disposal site owner/operator.
- B. Submit to the Owner/Consultant, copies of all notifications & permits and all worker certifications (certificates, training, medical, and fit-test).
- C. The Contractor must be able to provide Certified Payroll documentation to Martinez Couch & Associates, LLC, or its Representative or Project Auditors upon formal request.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

DIVISION II
SPECIAL CONDITIONS

FOREWORD

Supplementing Division I of the Specifications for the work to be performed under this Contract, DIVISION II, SPECIAL CONDITIONS, shall apply particularly to this Contract.

The enforcement of the requirements of any of the Special Conditions shall not be construed as waiving any of the rights of the Owner, contained in any of the other provisions of the Contract.

The Contract documents, including without limitation, these Special Conditions, shall be interpreted and construed as far as is reasonably possible to be in addition to, supplementary to and consistent with each other.

PART 1 - GENERAL**1.1 SUMMARY**

- A. Provide selective demolition as necessary to remove existing floor tiles and mastics and paper backing behind radiators.

1.2 PROJECT CONDITIONS

- A. Occupancy:
 - 1. Areas of the building in which selective demolition will occur will be unoccupied during work.
- B. Existing Conditions:
 - 1. After the project has begun, the Contractor is responsible for the condition of the structures to be selectively demolished.
 - 2. Unforeseen Conditions: Should unforeseen conditions be encountered that affect design or function of project, investigate and fully submit an accurate, detailed, written report to the office of the Owner. While awaiting a response, reschedule operations if necessary to avoid delay of the overall project.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Verify that utilities have been disconnected and sealed. (Where applicable).
- B. As practicable, arrange operations to reveal unknown or concealed conditions for examination and verification before removal or demolition.
- C. Verify actual conditions to determine, in advance, whether removal or demolition of any element will result in structural deficiency, overloading, failure, or unplanned collapse.

3.2 PREPARATION

A. Traffic:

1. Do not obstruct walks or public ways without the written permission of governing authorities and of the Owner. Where routes are permitted to be closed, provide alternate routes, if required.

B. Protection:

1. Provide for the protection of persons passing around or through the area of demolition.
2. Perform demolition so as to prevent damage to adjacent improvements and facilities to remain.
3. Protect walls, floors, and other new or existing work from damage during demolition operations.

3.3 POLLUTION CONTROLS

A. Control as much as practicable the spread of dust and dirt.

B. Observe environmental regulations.

C. Do not allow water usage that may result in freezing or flooding.

D. Do not allow adjacent improvements to remain to become soiled by demolition operations.

3.4 DEMOLITION - GENERAL

Not Applicable.

3.5 DISPOSAL OF NON-CONTAMINATED MATERIALS

A. Promptly dispose of materials resulting from demolition operations. Non-contaminated material shall be disposed of as general waste or recycled as applicable. Do not allow materials to accumulate on site.

B. All rubbish and waste material from the Work shall be neatly stacked or kept in suitable containers and removed from the premises daily. The premises shall be kept clean and in an orderly condition at all times to the satisfaction of the Owner.

C. Transport materials resulting from demolition operations and legally dispose of off-site.

- D. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

3.6 CLEANING

- A. Throughout the construction period, the Contractor shall maintain the building and site free of rubbish, debris, surplus materials, and other items not required for the Work. Remove such material from the site daily to prevent accumulations. Remove all construction debris from work areas, and remove all hazardous waste and asbestos waste, as required, by the most current federal, state, and local regulations and the requirements of the specifications.

END OF SECTION

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. General Provisions of Contract, including Supplementary Conditions and other Division 1 Sections, apply to this Section.
- B. Refer to other Sections of these Specifications to determine the type and extent of work therein affecting the work of this Section, whether or not such work is specifically mentioned herein.

1.2 SCOPE OF WORK

- A. Work outlined in this section includes all that is necessary for the complete removal and disposal of asbestos-containing materials (ACMs) identified in the areas as detailed below for 91 Dogwood Drive in Easton, CT. The Contractor is responsible for verification of all quantities of ACM scheduled for removal. This verification shall include an on-site walk-through inspection of the work area. The project is detailed in the following table.

TABLE 1: LIST OF ACMs

MATERIAL	LOCATION	ESTIMATED QUANTITY
9"x9" Floor tile and associated mastic	1 st floor Mudroom	182 square feet
	Basement (beneath stairs and closet)	45 square feet
Paper backing associated w/ heating unit	Mudroom, Dining Room, Living Room, Kitchen	72 square feet
Brown mastic associated w/ Ceramic wall tiles	Kitchen	50 square feet

1.3 DEFINITIONS

The following definitions relative to asbestos abatement apply:

1. ABATEMENT - Procedures to control fiber releases from asbestos-containing materials; includes removal, encapsulation, and enclosure.
2. AIR MONITORING - The process of measuring the airborne fiber concentration within an area or within a person's breathing zone.
3. AMENDED WATER - Water to which a surfactant has been added.
4. ASBESTOS - The name given to a number of naturally occurring fibrous silicates. This includes the serpentine forms and the amphiboles and includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite, or any of these forms, which have been chemically altered.
5. ASBESTOS PROJECT MONITOR (APM) - A professional capable of conducting air monitoring and analysis of samples for airborne fiber concentrations. This individual should be an industrial hygienist, an environmental scientist, or an engineer with experience in asbestos air monitoring and worker protection equipment and procedures. This individual should have demonstrated proficiency in conducting air sample collection in accordance with 29 CFR 1910.1001 and 29 CFR 1926.1101.
6. ASBESTOS WORK AREA - A regulated area as defined by OSHA 29 CFR 1926.1101 where asbestos abatement operations are performed which is isolated by physical barriers to prevent the spread of asbestos dust, fibers, or debris. The regulated area shall comply with requirements of regulated area for demarcation, access, respirators, prohibited activities, competent persons and exposure assessments and monitoring.
7. ASBESTOS FIBERS – Those asbestos particles with a length greater than five (5) microns and a length to diameter ratio of 3:1 or greater.
8. CLEAN ROOM - An uncontaminated area or room, which is a part of the worker decontamination enclosure with provisions for storage of workers' street clothes and protective equipment.
9. CLEARANCE SAMPLING - Final air sampling performed aggressively after the completion of the abatement project in a regulated area. Clearance sampling can be conducted by either of the following two methods:

- (A) Air samples collected by the air sampling professional having a fiber concentration of less than 0.01 fibers/cc of air in each of five (5) samples collected inside the containment will denote acceptable clearance sampling by Phase Contrast Microscopy (PCM).
 - (B) Five air samples collected inside the containment by the air sampling professional having an average asbestos concentration of less than 70 structures per square millimeter of air will denote acceptable clearance sampling for Transmission Electron Microscopy (TEM).
10. COMPETENT PERSON - As defined by 29 CFR 1926.1101, a representative of the Abatement Contractor who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure. In addition has authority to take prompt corrective measures to eliminate such hazards during asbestos removal. Competent person shall be properly trained in accordance with Environmental Protection Agency's (EPA) Model Accreditation Plan.
 11. CURTAINED DOORWAY - A device to allow ingress and egress from one area to another while permitting minimal air movement between the areas. Two curtained doorways spaced a minimum of six feet apart can form an airlock.
 12. DECONTAMINATION ENCLOSURE SYSTEM - A series of connected areas, with curtained doorways between any two adjacent areas, for the decontamination of workers and equipment. A decontamination enclosure system always contains at least one airlock and is adjacent and connected to the regulated area, where possible.
 13. ENCAPSULANT - A liquid material which can be applied to asbestos-containing materials which controls the possible release of asbestos fibers from the materials either by creating a membrane over the surface (bridging encapsulant) or penetrating the material and binding its components together (penetrating encapsulant).
 14. EQUIPMENT ROOM – Any contaminated area or a room that is part of the worker decontamination enclosure with provisions for storage of contaminated clothing and equipment.
 15. FIXED OBJECT - Unit of equipment or furniture in the work areas that cannot be removed from the work area.
 16. FRIABLE ASBESTOS MATERIALS - Any material that contains more than 1% asbestos by weight, that can be crumbled, pulverized or reduced to powder by hand pressure.
 17. GLOVE BAG - A manufactured polyethylene bag type of enclosure with built-in gloves such as is placed with an airtight seal around asbestos-containing material and which permits the asbestos-containing materials contained by the bag to be removed

without releasing asbestos fibers to the atmosphere. The use of glove bag is permitted for removal and repair of small amount (less than 3 linear feet/3 square feet) of ACM.

18. HEPA FILTER - High Efficiency Particulate Air (HEPA) filter in compliance with ANSI Z9.2-1979.
19. HEPA VACUUM EQUIPMENT - Vacuum equipment equipped with a HEPA filter system for filtering the effluent air from the unit.
20. MOVABLE OBJECT - Unit of equipment or furniture in the work area that can be removed from the work area.
21. NEGATIVE AIR PRESSURE EQUIPMENT - A portable local exhaust ventilation system equipped with HEPA filtration used to create negative pressure in a regulated area (negative with respect to adjacent unregulated areas) and capable of maintaining a constant, low velocity air flow into regulated areas from adjacent unregulated areas.
22. NESHAPS - National Emissions Standard for Hazardous Air Pollutants regulations enforced by the EPA.
23. PERMISSIBLE EXPOSURE LEVEL (PEL) - The average airborne concentration of asbestos fibers to which an employee is allowed to be exposed over an eight-hour period. The PEL established by OSHA 29 CFR 1926.1101 is 0.1 fibers per cubic centimeter of air averaged over an eight-hour time period. An airborne fiber concentration of 1.0 fibers /cc averaged over a sampling period of 30 minutes is the Excursion Limit. The Contractor is responsible for maintaining work areas in a manner that this standard is not exceeded.
24. REGULATED AREA - An area established by the employer to demarcate where Class I, II, and III asbestos work is conducted and any adjoining area where debris and waste from such asbestos work accumulate, and a work area within which airborne concentrations of asbestos fibers may exceed the PEL.
25. SHOWER ROOM - A room between the clean room and the equipment room in the work decontamination enclosure with hot and cold running water and suitably arranged for employee showering during decontamination. The shower room is located in an airlock between the contaminated area and the clean area.

1.4 SUBMITTALS

- A. The Contractor shall submit the following to the Owner prior to the start of the project:
1. Evidence that the Contractor is certified to perform asbestos abatement work in the State of Connecticut.
 2. Schedule to the Owner, which defines a timetable for executing and completing the project, including set-up, removal, cleanup, decontamination, and air clearance monitoring.
 3. The identity and licensing of the hauling contractor and the landfill to be used.
 4. Connecticut certificates of licensure (current) and training (both initial and current refresher), current respirator fit test records, and current medical records for each employee who may be on the project site. No individual shall provide services as an asbestos abatement site supervisor or as an asbestos abatement worker without a license to do so issued by the CTDPH.
 5. Signed copy of the Certificate of Workers Acknowledgment found at the end of this section for each worker who is to be at job site.
 6. Detailed product information on all materials and equipment proposed for asbestos abatement work on this project.
- B. The following shall be available onsite during the work:
1. Training, State certification, respirator fit test, and medical records for employees to start work.
- C. The following shall be submitted to the Owner at the completion of work:
1. Completed Punch List.
 2. Completed copies of Waste Shipment Records (WSR).

1.5 REGULATIONS AND STANDARDS

- A. The Contractor shall be solely responsible for conducting this project and supervising all work in a manner which will be in conformance with all federal, state, and local regulations and guidelines pertaining to asbestos abatement. Specifically, the Contractor shall comply with the requirements of the following:

1. U.S. Environmental Protection Agency (USEPA) National Emissions Standards for Hazardous Air Pollutants (NESHAP) Regulations (40 CFR 61, Subpart M);
2. Occupational Safety and Health Administration (OSHA) Asbestos Regulations (29 CFR 1910.1001 and 1926.1101);
3. State of Connecticut Department of Public Health (CTDPH) Standards for Asbestos Abatement Sections 19a-332a-1 through 19a-332a-16 inclusive and Sections 20-440-1 through 20-440-9 inclusive;
4. State of Connecticut Department of Energy & Environmental Protection (CTDEEP) Regulations, Section 22a-209-8(i) and Section 22a-220 of the Connecticut General Statute.
5. Connecticut Basic Building Code (BOCA)
6. National Fire Protection Association (NFPA) Life Safety Code;
7. Local health and safety codes, ordinances or regulations pertaining to asbestos abatement and all national codes and standards including Association for Standards of Testing and Materials (ASTM), American National Standards Institute (ANSI), and Underwriters Laboratories (UL).
8. Occupational Safety and Health Administration (OSHA) (29 CFR 1910 Subpart D) and (29 CFR 1926 Subpart M) Fall Protection.

1.6 EXEMPTIONS

- A. Any deviations from these Specifications require the written approval and authorization from the Owner and Consultant Asbestos Project Designer.
- B. Any deviation in work practices identified in CTDPH Standards for Asbestos Abatement, Sections 19a-332a-1 to 19a-332a-23, Sections 20-440-1 to 20-440-9, Section 20-441, and Section 19a-332e-1 to 19a-332e-2, must be requested in writing and approved in writing by the CTDPH.

1.7 FINAL VISUAL INSPECTION AND CLEARANCE AIR SAMPLING

- A. Following the completion of the final cleaning phase of the work in a contained work area, the Consultant shall conduct a final visual inspection of the area. The Contractor shall be responsible for meeting final visual criteria, which is the absence of visible debris, as specified in CTDPH regulation 19a-332a-12(b).

- B. Following the completion of the final visual inspection, and upon which time the Consultant agrees that the Contractor has met the final visual criteria and the work area has been encapsulated, the Consultant will collect final clearance air samples in work area(s) as required. The Owner shall be responsible for payment of the sampling and analysis of the first round of final air clearance samples only for a particular work area. The Contractor shall be responsible for payment of all costs associated with the collection and analysis of additional final air clearance samples if the first round samples fail to meet the designated clearance criteria of 0.010 fibers/cubic centimeter (f/cc) by phase contrast microscopy (PCM) or <70 structures per square millimeter (s/mm) by transmission electron microscopy (TEM).

1.8 NOTIFICATIONS, POSTINGS, SUBMITTALS, AND PERMITS

- A. The Contractor shall make the following notifications and provide submittals to the following agencies prior to the commencement of removal work. This notification is required ten (10) calendar days prior to the start of the abatement project:

1. State of Connecticut
Department of Public Health
Indoor Air Program
410 Capitol Avenue
P.O. Box 340308
Hartford, CT 06134-0308

Note: Required for abatement occurring in a School facility. Also satisfies the requirement to notify the EPA.

2. State of Connecticut
Department of Energy & Environmental Protection
Health Services and Solid Waste management Unit
79 Elm Street
Hartford, CT 06106
(Only if asbestos waste is disposed of in Connecticut)

- B. The minimum information included in the notification to these agencies includes:
1. Name and address of site owner/operator.
 2. Site location.
 3. Amount of friable and non-friable asbestos-containing materials to be removed.
 4. Work schedule, including proposed start and completion dates.
 5. Asbestos removal procedures to be used.
 6. Name and location of disposal site for generated asbestos waste, residue, and debris.

1.9 WORK SITE SAFETY PLAN

- A. The Contractor shall establish a set of emergency procedures and shall post them in a conspicuous place at the work site. The safety plan should include provisions for the following:
1. Evacuation of injured workers.
 2. Emergency and fire exit routes from all work areas.
 3. Emergency first aid treatment.
 4. Local telephone numbers for emergency services including ambulance, fire, and police.
 5. Methods to notify appropriate personnel in the event of a fire or other emergency requiring evacuation of the site or area.
 6. Site safety plan for fall protection.
- B. The Contractor is responsible for training all workers in these procedures.

1.10 CONTROL OVER REMOVAL WORK

- A. At the discretion of the owner, all work procedures may be continuously monitored by the Consultant's Asbestos Project Monitor (APM) to determine that areas outside the designated work area(s) have not been contaminated.

- B. Prior to work on any given day, the Contractor's designated "Competent Person" shall discuss the day's work schedule with the APM to evaluate job tasks with respect to safety procedures and requirements specified to prevent contamination outside the work area. This includes a visual survey of the work area(s) and the decontamination enclosure systems. (if applicable)

- C. The Contractor shall maintain control of and be responsible for access to all work areas to ensure the following requirements:
 - 1. Non-essential personnel are prohibited from entering the area.

 - 2. All authorized personnel entering the work area shall read the "Worker Protection Procedures" which are posted at the entry points to the enclosure system, and shall be equipped with properly fitted respirators and protective clothing.

 - 3. All personnel who are exiting from the decontamination enclosure system shall be properly decontaminated.

 - 4. Asbestos waste that is taken out of the work area must be properly bagged and labeled in accordance with these specifications. The surface of the bags shall be decontaminated. Asbestos waste leaving the enclosure system must be immediately transported off site or immediately placed in locked, posted temporary storage on site, and removed within 24 hours of the project conclusion. The Contractor will seek permission of the Owner to place a temporary dumpster at a suitable location (if applicable).

 - 5. Any material, equipment, or supplies that are brought out of the decontamination enclosure system shall be cleaned and decontaminated by wet cleaning and/or HEPA vacuuming of all surfaces.

1.11 PROPER WORKER PROTECTION

- A. This section describes the equipment and procedures required for protecting workers against asbestos contamination and other workplace hazards except for respiratory protection.

- B. All workers are to be accredited and certified as Asbestos Abatement Workers as required by the CTDPH.

- C. The Contractor is required to be certified, accredited, and licensed as required by the CTDPH.

- D. In accordance with 29 CFR 1926.1101, all workers shall receive a training course covering the dangers inherent in handling asbestos, the dangers of breathing asbestos dust, proper work procedures, and proper worker protective measures. This course must include but is not limited to the following:
1. Methods of recognizing asbestos.
 2. Health effects associated with asbestos.
 3. Relationship between smoking and asbestos in producing lung cancer.
 4. Nature of operations that could result in exposure to asbestos.
 5. Importance of and instruction in the use of necessary protective controls, practices and procedures to minimize exposure including:
 - a. Engineering controls
 - b. Work practices
 - c. Respirators
 - d. Housekeeping procedures
 - e. Hygiene facilities
 - f. Protective clothing
 - g. Decontamination procedures
 - h. Emergency procedures
 - i. Waste disposal procedures
 6. Purpose, proper use, fitting, instructions, and limitations of respirators as required by 29 CFR 1910.134.
 7. Appropriate work practices for the work.
 8. Requirements of medical surveillance program.
 9. Review of 29 CFR 1926.
 10. Pressure differential systems.
 11. Work practices including hands on or on-job training.
 12. Personal Decontamination procedures.
 13. Air monitoring, personal and area.
- E. The Contractor shall provide medical examinations for all workers who may encounter an airborne fiber level of 0.1 f/cc or greater for an eight-hour Time Weighted Average (TWA). In the absence of specific airborne fiber data, provide

medical examinations for all workers who will enter the work area for any reason. Examination shall at a minimum meet OSHA requirements as set forth in 29 CFR 1926.1101. In addition, provide an evaluation of the individual's ability to work in environments capable of producing heat stress in the worker.

- F. Submit the following to the Owner/Consultant for review. The Contractor shall not start work until the Owner/Consultant reviews the submittals and indicates that they are acceptable.
1. Certificates from an EPA-approved AHERA Abatement Workers course for each worker as evidence that each Asbestos Abatement Worker is accredited as required by the AHERA Regulation 40 CFR 763 Appendix C to Subpart E, April 30, 1987.
 2. Evidence that the Contractor is certified to perform asbestos abatement work by the State of Connecticut Department of Public Health.
 3. An original signed copy of the Certificate of Worker's Acknowledgment found at the end of this section, for each worker who is to be at the job site or enter the Work Area.
 4. Documents verifying that each worker has had a medical examination within the last 12 months as part of compliance with OSHA medical surveillance requirements. Submit, at a minimum, for each worker the following:
 - a. Name and Social Security Number.
 - b. Physicians Written Opinion from examining physician including at a minimum the following:
 - 1) Whether worker has any detected medical conditions that would place the worker at an increased risk of material health impairment from exposure to asbestos.
 - 2) Any recommended limitations on the worker or on the use of personal protective equipment such as respirators.
 - 3) Statement that the worker has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.
 5. Information that was provided to physician in compliance with 29 CFR 1926.1101.
 6. A statement that the worker is able to wear and use the type of respiratory protection proposed for the project, and is able to work safely in an environment capable of producing heat/cold stress in the worker.

- G. Certification signed by an officer of the company and notarized which states that exposure measurements, medical surveillance, and worker training records are being kept in conformance with the requirements of OSHA 29 CFR 1926.

1.12 CONTRACTOR'S AIR SAMPLING RESPONSIBILITY

- A. The Contractor is responsible for monitoring airborne asbestos fiber concentrations in the workers' breathing zones and to establish conditions and work procedures for maintaining compliance with OSHA Regulations 29 CFR 1910.1001, and 1926.1101.
- B. The air sampling procedures shall ensure proper documentation of all personal air-sampling results. Documentation for personal sampling must be available at the job site for review by federal and/or state regulatory agencies.
- C. All air sampling shall be conducted in accordance with methods described in OSHA Standards 29 CFR 1910.1001 and 1926.1101. The flow rate for air samples will not be less than 0.5 liters/minute and must not exceed 2.5 liters/minute.

1.13 RESTRICTIONS ON CONTRACTOR'S USE OF GROUNDS

- A. The Contractor shall confine his/her operations to the actual work site, access routes and storage areas designated by the Owner. The Contractor may place a dumpster at a place designated by the Owner.
- B. The Contractor shall have sole responsibility for providing all materials, equipment, or tools and any storage required shall be at the Contractor's own risk. The Owner will not assume responsibility for any loss of materials, equipment, or tools stored on its property.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.
- B. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with asbestos shall be decontaminated or disposed of as asbestos waste.
- C. Polyethylene sheet in a roll size to minimize the frequency of joints shall be delivered to the job site with factory label indicating 4 or 6 mil thickness.
- D. Polyethylene disposable bags shall be six (6) mil thick with pre-printed labels.

- E. Tape and adhesive spray will be capable of sealing joints in adjacent polyethylene sheets and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.
- F. Surfactant (wetting agent), shall consist of fifty (50) percent polyoxyethylene ether and fifty (50) percent polyoxyethylene ester, or equivalent, and shall be mixed with water to provide a concentration of one (1) ounce surfactant to five (5) gallons of water or as directed by manufacturer.
- G. Removal encapsulant shall be non-flammable factory prepared penetrating chemical encapsulant found acceptable to Consultant. Usage shall be in accordance with manufacturer's printed technical data.
- H. The Contractor shall have available spray equipment capable of mixing wetting agent with water and capable of generating sufficient pressure and volume and having sufficient hose length to reach all areas where asbestos is present.
- I. Impermeable containers are to be used to receive and retain any asbestos- containing or contaminated materials until disposal at an acceptable disposal site. (The containers shall be labeled in accordance with OSHA Standard 29 CFR 1926.1101) Containers must be both air and watertight.
- J. Labels and signs, as required by OSHA Standard 29 CFR 1926.1101 will be used.
- K. Encapsulant shall be bridging or penetrating type which has been found acceptable to the Consultant. Usage shall be in accordance with manufacturer's printed technical data.
- L. A high efficiency particulate air (HEPA)-filtered local exhaust ventilation shall be utilized during the installation of enclosures and supports where asbestos-containing materials may be disturbed.

2.2 TOOLS AND EQUIPMENT

- A. The Contractor shall provide all tools and equipment necessary for asbestos removal.
- B. The Contractor's air monitoring professional shall have air-monitoring equipment of type and quantity to monitor operations and conduct personal exposure monitoring per OSHA requirements.
- C. The Contractor shall have available sufficient inventory of dated purchase orders for materials necessary for the job including protective clothing, respirators, filter cartridges, polyethylene sheeting of proper size and thickness, tape and air filters.

- D. The Contractor shall have available power cables or power sources such as generators (where required).
- E. Exhaust air filtration system units shall contain HEPA filter(s) capable of sufficient air exhaust to create negative pressure of at least 0.02 inches of water column within each enclosure with respect to outside areas. Equipment shall be checked for proper operation by smoke tubes or differential pressure gauge before the start of each shift and at least twice during the shift. Adequate exhaust air shall be provided for a minimum of four (4) air changes per hour within the enclosure. No air movement system or air filtering equipment shall discharge unfiltered air outside, nor shall filtered air units be exhausted indoors from the work area.
- F. Vacuum units, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometers in diameter or larger.
- G. The Contractor will have reserve units so that the exhaust air filtration system will operate continuously.

2.3 ELECTRICAL

- A. If the Contractor elects to furnish and install a portable ground fault circuit interrupter (GFCI) Power Supply Board and receptacles, it shall include the following:
 - 1. All circuits individually GFCI-protected.
 - 2. Weatherproof enclosure NEMA 3 (rain-tight) with receptacle covers.
 - 3. Construction durable, 16-gauge steel construction.
 - 4. At least two 20-amp circuits (for APM).
 - 5. Main circuit breaker.
 - 5. Components UL listed.
 - 6. At least two 20-amp circuits (for Decontamination Facility).
- B. The Contractor shall furnish and install wiring as follows:
 - 1. Size the wire to limit voltage drop to a maximum of 3% with length of run.
- C. The Contractor will supply additional lighting for all abatement work areas if necessary to provide sufficient lighting.

- D. As necessary, the Contractor will de-energize, lockout, and tag existing electrical components within the work area at their closest main source.
- E. The Contractor shall provide all electrical connections and equipment necessary to supply “bead/shot” machine.
- F. The Owner will furnish electrical power for the project.

PART 3 - EXECUTION

3.1 WORKER PROTECTION

A. General:

1. All asbestos abatement work shall be performed in accordance with 29 CFR 1910.1001, 29 CFR 1926.1101 and State of Connecticut regulations as specified herein. Personnel shall wear and utilize protective clothing and equipment as specified herein. Eating, smoking, drinking, chewing gum, or applying cosmetics shall not be permitted in the asbestos control area. Personnel of other trades not engaged in the abatement of asbestos shall not be allowed in the work area unless all the personnel protection provisions of this Specification are complied with by the trade personnel.
2. Engineering controls shall be used to minimize airborne fiber concentrations within the work area. A combination of personal protective equipment and work practices shall also be used to further reduce employee exposure to asbestos fibers.
3. The Contractor shall provide all authorized visitors with respirators, new filters, protective clothing, headgear, eye protection, footwear, and hard hats as in the procedures described herein and afford them the use of all facilities to keep them free of contamination from asbestos fibers.
4. The Contractor shall provide the decontamination facility for worker and equipment decontamination as well as the results of the personal air monitoring.

B. Respiratory Protection:

1. The Contractor shall select and provide at no cost to his/her employees respirators, which shall provide adequate protection to the employee as specified by Section 1910.1001(g) Table D-1 and Section 1926.1101(h) Table D-4.

2. Respiratory protection shall be worn by all persons potentially exposed to elevated airborne concentrations of asbestos fibers from the initiation of the asbestos abatement project until all areas have been given clearance. Clearance shall be conducted by the APM.
3. The Contractor shall provide Powered Air Purifying Respirators (PAPR) or Type C (continuous flow or pressure demand) supplied air respirators to all workers at the job site. If it is established, through collection and analysis of personal air samples in accordance with the OSHA Reference Method (ORM) (See U.S. Department of Labor; Occupational Safety and Health Administration; Occupational Exposure to Asbestos; Title 29 CFR 1910.1001, "General Industry Standard." Title 29 CFR 1926.1101, "Construction Standard") that this respiratory protection is more than sufficient the Contractor may provide half face-piece air purifying respirators.
 - a. Once the exposure limits have been established, the respirators presented in 29 CFR 1910.1001 that afford adequate protection at such upper concentrations of airborne asbestos fibers shall be used.
 - b. The minimum personal sampling period shall be seven hours at a flow rate of 0.5 to 2.5 liters per minute. The samples shall be collected within the workers' breathing zone. Personal sampling shall be the responsibility of the Contractor. Personal sampling results shall be available on site no later than 24 hours after sampling.
 - c. The filters provided for both the cartridge respirators and the PAPR's shall be National Institute for Occupational Safety and Health (NIOSH) approved for asbestos fibers.

C. Protective Clothing:

1. The Contractor shall provide to all workers, foreman and superintendents, protective disposable clothing consisting of full body coveralls, head covers, and 18-inch high boot type covers or reusable footwear.
2. The Contractor shall provide eye protection and hard hats, as required, by job conditions and safety regulations.
3. Reusable footwear, hard hats and eye protection devices shall be left in the "contaminated equipment room" until the end of the asbestos abatement work.
4. Upon completion of asbestos abatement work, the footwear shall be disposed of as contaminated waste or cleaned thoroughly inside and out using soap and water before removing from work area or from equipment and access area.

5. All disposable protective clothing shall be discarded and disposed of as asbestos waste when the wearer exits from the workspace to the outside through the decontamination facilities.
6. The color of the disposable clothing worn outside the work area shall be a different color than the disposable clothing worn inside the work area.

D. Decontamination Procedures:

1. Each worker and authorized visitor without exception shall, upon entering the job site: remove street clothes in the clean change room and put on an appropriate respirator with new filters, and clean disposable protective clothing before entering the equipment room or the work area, except that workers intending to re-wear previously worn protective clothing stored in the equipment room shall enter the equipment room wearing only respirators.
2. Each time he/she leaves the work area, each worker and authorized visitor shall:
 - a. Vacuum gross contamination from clothing before leaving the work area.
 - b. Proceed to the equipment room and remove all clothing except respirator.
 - c. Still wearing the respirator, proceed unclothed into the showers.
 - d. Clean the outside of the respirator with soap and water while showering.
 - e. Remove filters, wet them, and dispose of filters in the container provided for that purpose.
 - f. Wash and rinse the inside of the respirator. After showering, dry off with disposable towels.
3. Following showering and drying off, each worker and authorized visitor shall proceed directly to the clean change room and dress in street clothes at the end of the day's work, or before eating, smoking, or drinking.
4. Contaminated reusable work footwear shall be stored in the equipment room when not in use in the work area. Upon completion of asbestos abatement work, footwear shall be disposed of as contaminated waste or cleaned inside and out using soap and water before removing these items from the work area

or from the equipment and access area. Contaminated protective clothing shall be stored in the equipment room for reuse or placed in receptacles for disposal with other asbestos-contaminated materials.

3.2 WORK AREA PREPARATION

- A. Where necessary, within regulated areas, shut down electrical power, including receptacles and light fixtures. Under no circumstances during the abatement process will existing lighting fixtures inside the regulated area be permitted to be operating. Provide GFCI devices, temporary power, and temporary lighting installed in compliance with the applicable electrical codes and by a licensed electrician. Electrical receptacles inside work area may not be used unless they are protected by GFCI devices.
- B. Shut down and/or isolate heating, cooling, and ventilation air systems or zones to prevent contamination and fiber dispersal to other areas of the structure. During the work, vents within the work area shall be sealed with duct tape and polyethylene sheeting.
- C. Seal off all openings, including, but not limited to, separations to occupied areas, windows, corridors, doorways, skylights, ducts, grills, diffusers, and any other penetration of the work areas, with polyethylene sheeting a minimum of six (6) mil thick, sealed with duct tape.
- D. Remove moveable objects within the proposed work area to the extent possible before the work starts.
- E. Pre-clean fixed objects within the work areas, using HEPA vacuum equipment and/or wet cleaning methods as appropriate, and enclose with a minimum six (6) mil plastic sheeting sealed with duct tape.
- F. Clean the proposed work areas using HEPA vacuum equipment or wet cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.
- G. Remove binding strips, all vinyl cove base, or other restrictive molding that are in the way of abatement activities from doorways, walls, etc. and dispose of as general waste.
- H. After HEPA vacuum/wet cleaning, work area containment shall be constructed of a minimum 2 layers of 4 mil sheeting on all walls. In all areas that require the Contractor to install a ceiling of containment, one layer of 6 mil sheeting shall be utilized.

- I. Install adequate number of HEPA ventilation units to achieve the required number of at least 4 air changes per hour and exhaust units to the exterior of the building.

3.3 DECONTAMINATION SYSTEM

- A. The Contractor shall establish a decontamination enclosure (decon) contiguous to the work area consisting of equipment room, shower room, and clean room in series. The only access between contaminated and uncontaminated areas shall be through this decontamination enclosure.
- B. Access between rooms in the decontamination system shall be through double-flap curtained openings. The clean room, shower room and the equipment room within the decontamination enclosure shall be completely sealed ensuring that the sole source of airflow through this area originates from uncontaminated areas outside the work area.
- C. Construct the decontamination system with PVC, metal, or other equivalent rigid framing and cover both sides with a double layer of six (6) mil polyethylene sheeting, spray glued and taped at the joints.

3.4 MAINTENANCE OF THE WORK AREA

- A. Acceptance of Asbestos Control Area: The Contractor shall not begin removal unless the APM is in attendance. The control area must be constructed, the decontamination facility prepared and the supplies to be used assembled, barriers properly constructed, openings sealed, and other preparations made to allow the removal operation to proceed. If conditions are not acceptable, the Contractor shall correct deficiencies to comply with the specifications.

3.5 ASBESTOS REMOVAL PROCEDURE - GENERAL

- A. The Contractor shall have a designated "Competent Person" on the job at all times to ensure establishment of a proper enclosure system and proper work practices throughout project.
- B. Abatement work will not commence until authorized by on-site APM (if applicable).
- C. Spray asbestos materials with amended water using airless spray equipment or apply approved removal wetting agent to reduce the release of fibers during removal operation. The Consultant shall pre-approve the use of amended water as the wetting agent.
- D. In order to maintain indoor airborne asbestos fiber concentrations to the minimum, the wet asbestos must be removed in manageable sections.

- E. Fill disposal containers as removal proceeds, seal filled containers and clean containers before removal to equipment decontamination system. Wet clean each container thoroughly, double bag and apply caution label. Ensure that workers do not exit the work area through the equipment decontamination enclosure.
- F. After completion of stripping work, all surfaces from which asbestos has been removed shall be wet brushed, using a nylon brush, wet wiped, and sponged or cleaned by an equivalent method to remove all visible material. During this work, the surfaces being cleaned shall be kept wet.
- G. Remove and containerize all visible accumulations of asbestos-containing and/or asbestos-contaminated debris. During cleanup, utilize brooms, rubber dustpan, and rubber squeegees.
- H. Sealed disposal containers, and all equipment used in the work area, shall be included in the cleanup and shall be removed from work areas via the equipment decontamination enclosure at an appropriate time in the cleaning sequence. All asbestos waste shall be placed in 6-mil polyethylene disposal bags and shall be double bagged in the equipment decontamination enclosure before removal from the site.
- I. At any time during asbestos removal, should the APM suspect contamination of areas outside the work area(s), he/she shall cause all abatement work to stop until the Contractor takes steps to decontaminate these areas and eliminate the causes of such contamination. Unprotected individuals shall be prohibited from entering suspected contaminated areas until air sampling and visual inspections certify decontamination.
- J. After completion of the initial final cleaning procedure but prior to encapsulation, a pre-sealant inspection shall be conducted by the APM. The pre-sealant inspection shall verify that ACM and residual dust has been removed from the work area.

3.6 ASBESTOS REMOVAL PROCEDURE - FLOOR TILE & MASTIC

- A. Prior to beginning the removal of any resilient floor covering, remove all movable objects from the work area. If applicable, remove the bookcases, counters, and radiators to access the floor tile and mastic that go underneath those items.
- B. Remove resilient tile floor covering using the following procedure:
 - 1. Dispose of any materials that have floor mastic on them as asbestos-containing waste. The contractor may have to perform selective destructive demolition, such as removing carpeting or partition walls, to access the tile.

2. Wet the floor with amended water, removal encapsulant, or detergent solution, so that entire surface is wet. Do not allow puddle or run off to other areas. If a removal encapsulant is used, use in strict accordance with manufacturer's instructions. Cover with sheet polyethylene to allow humidity to release tile from floor. Allow time for humidity and water or removal encapsulant to loosen tiles prior to removal.
3. Keep floor continuously wet throughout removal operation.
4. Remove all layers of tiles using a manual or powered spade, or stripping machine. Continuously mist floor in area with amended water, removal encapsulant or detergent solution. Wet any debris generated as necessary to keep continuously wet. Keep floor where tile has been removed continuously wet until after completion of mastic removal.
5. After completion of floor tile removal, the Contractor shall remove mastic adhesive. Floor mastics may be removed using low odor chemical strippers in accordance with manufacturer's instructions.

C. Debris and Waste

1. Pick up whole tiles, stack, place in boxes or wrap in felt, and place in labeled disposal bags. At the Contractor's option tiles may be placed directly into durable leak-tight containers.
2. Shovel broken tiles, mastic saturated absorbent materials, and debris into nylon reinforced grain bags that are placed in a disposal bag, or place directly in steel leak-tight drums.
3. Place bagged waste in a second disposal bag and dispose of as asbestos waste.

D. After completion of all resilient flooring and mastic removal work, the Contractor shall conduct final cleaning.

3.7 ASBESTOS REMOVAL PROCEDURE – PAPER ASSOC. W/ RADIATOR

- A. Remove paper backing associated with radiators using the following procedure:
1. Ensure that plumbing has been disconnected from each radiator prior to start of work.
 2. Remove radiator from wall.
 3. Wet wipe and HEPA vacuum radiator unit and remove from work area.

4. Place a drop cloth consisting of 1 layer of 6 mil polyethylene sheeting on the floor below paper backing and secure in place.
 5. Thoroughly wet entire surface of paper backing with amended water.
 6. Remove paper backing as intact as feasible and place directly into waste bag.
 7. Ensure that waste is adequately wetted inside of waste bag.
 8. Place bagged waste in a second disposal bag.
 9. Label each bag for disposal as asbestos waste.
- B. After completion of all removal work, the Contractor shall conduct final cleaning.

3.8 ASBESTOS REMOVAL PROCEDURE – CERAMIC WALL TILE MASTIC

- A. Remove ceramic wall tile mastic using the following procedure:
1. Dispose of any materials that have tile mastic on them as asbestos-containing waste.
 2. Wet the wall tile with amended water, removal encapsulant, or detergent solution, so that entire surface is wet. Do not allow puddle or run off to other areas. If a removal encapsulant is used, use in strict accordance with manufacturer's instructions.
 3. Keep wall tile continuously wet throughout removal operation.
 4. Remove wall tiles using a manual chisel or spade. Continuously mist wall in area with amended water or detergent solution. Wet any debris generated as necessary to keep continuously wet. Keep wall where tile has been removed continuously wet until after completion of mastic removal.
 5. After completion of wall tile removal, the Contractor shall remove mastic adhesive.
 6. Remove mastic using a manual chisel or spade. Continuously mist wall in area with amended water or detergent solution. Wet any debris generated as necessary to keep continuously wet.
- B. Debris and Waste

1. Pick up whole tiles, stack, place in boxes or wrap in felt, and place in labeled disposal bags. At the Contractor's option tiles may be placed directly into durable leak-tight containers.
 2. Shovel broken tiles and debris into nylon reinforced grain bags that are placed in a disposal bag, or place directly in leak-tight drums.
 3. Place bagged waste in a second disposal bag and dispose of as asbestos waste.
- C. After completion of all wall tile and mastic removal work, the Contractor shall conduct final cleaning.

3.8 CONSULTANT AND SUSPENSION OF WORK

- A. The Owner has designated FSS to perform the duties of the Consultant for this Contract. The Consultant will also act as the APM for the project.
- B. The removal work shall be reviewed by the Consultant. The Contractor will request an inspection at least 24 hours in advance of requiring the inspection.
- C. During the progress of the work, the Consultant, following approval by the Owner, shall have the right to make any changes, alterations, additions or omissions in the work or Specifications in accordance with the General Conditions.
- D. The Consultant will recommend that the Owner order a suspension of work based on a determination of risk of adverse health and safety impacts on the environment, workers, or the general public, or failure to comply with the Specifications/regulations. The Contractor and the Owner will be notified in writing of the reason and of the recommended resolution.
- E. At the discretion of the Owner, the Consultant will provide oversight and visual inspection services throughout the Contract's duration. It shall be the Contractor's responsibility to comply with pertinent work standards and regulations.
- F. Upon completion of work in a defined work area, the Consultant will conduct a final visual inspection for the purpose of evaluating work completion. Unsatisfactory conditions shall be immediately corrected in a manner specified by the Consultant and the contract documents. Final payments shall be approved only after the Owner receives all properly completed Waste Shipment Record Forms and other required documentation and records.

3.9 CONSULTANTS' AIR SAMPLING RESPONSIBILITIES

- A. Air sampling shall be conducted by the Consultant to ascertain the integrity of controls that protect the building from asbestos contamination.
- B. Consultant's APM shall collect and analyze air samples during the following time periods:
 - 1. Pre-Abatement Period: The APM may collect samples prior to abatement work to establish baseline readings. These samples will be collected in and around the proposed work areas. Pre-abatement air samples shall be collected as required to obtain a volume of 1,200 liters. Pre-abatement and during abatement Samples shall be analyzed by PCM methodology using the NIOSH 7400 protocol.
 - 2. Abatement Period: The APM may collect samples when onsite on a daily basis during the work period. A sufficient number of area samples shall be taken outside of the work area to judge the degree of cleanliness or contamination of the building during removal. Additional samples may be taken inside the work area at the discretion of the APM.
 - 3. Post-Abatement Period: As required by the regulation, the APM shall conduct air sampling following the final cleanup phase of the project, once the "no visible residue" criterion, as established by the project monitor, has been met. Five (5) samples shall be collected inside the work area utilizing aggressive methods to comply with the State of Connecticut Department of Public Health Standards for Asbestos Abatement, sections 19a-332a-12. Analysis of the samples to determine airborne concentrations of asbestos shall be conducted by Transmission Electron Microscopy (TEM) method with an upper limit of 70.0 structures per square millimeter (s/mm²) as an average concentration of airborne fibers in five (5) samples; or by Phase Contrast Microscopy (PCM) to show that the concentration of fibers for each of the five (5) samples is less than or equal to a limit of quantitation for PCM - 0.01 fibers per cubic centimeter (0.01 f/cc) of air in accordance with the above regulations.
- C. At the direction of the Owner, the APM shall provide ongoing evaluation of the air quality within the building during removal, using his/her best professional judgments with respect to the State of Connecticut Department of Public Health guideline of 0.010 fibers/cc and the background air quality established during the pre-abatement period.

- D. If the APM determines that the building air quality has become contaminated from the project, he/she shall immediately inform the Contractor to cease all removal operations and implement a work stoppage clean up procedure. The Contractor shall conduct a thorough cleanup of the areas of the building designated by the Consultant. No further removal work can take place until the APM has assessed that the building air has been decontaminated.

3.10 CONSULTANT'S INSPECTION RESPONSIBILITIES

- A. Inspections shall be conducted by the APM as required, throughout the progress of the abatement project. Inspections shall be conducted in order to document the progress of the abatement work as well as the procedures and practices employed by the Contractor.
- B. The APM shall perform the following inspections during the course of abatement activities:
1. Pre-commencement Inspection (optional). Pre-commencement inspections may be performed at the time requested by the Contractor. The APM shall be informed sufficiently in advance of the time the inspection is needed. During the course of the pre-commencement inspection, the APM shall inspect the containment and surrounding work areas. This shall include, but not be limited to, inspection of barrier integrity, worker decontamination facility, utilization of power sources, and location and capacity of negative air filtration devices. If, during the course of the pre-commencement inspection, deficiencies are found, the Contractor shall perform the necessary adjustments in order to obtain compliance.
 2. Work Area Inspections. Work area inspections may be conducted on a daily basis at the discretion of the Owner/Consultant. During the course of the work inspections, the APM shall observe the Contractor's removal procedures, verify barrier integrity, monitor negative air filtration devices, assess project progress, and inform the Contractor of specific remedial activities if deficiencies are noted.
 3. Pre-sealant Final Visual Inspection. A pre-sealant inspection for each work area shall be conducted by the APM upon the request of the Contractor. The pre-sealant inspection shall be conducted after completion of the initial cleaning procedures, but prior to encapsulation. The pre-sealant inspection shall verify that no visible ACM or residual debris remain in the work area. If, during the course of the pre-sealant inspection, the APM identifies visible residual ACM or debris, the Contractor shall re-clean the work area until it is deemed acceptable by the APM.

3.11 WASTE DISPOSAL

- A. All waste material shall be promptly wetted and placed in 6-mil polyethylene bags or wrapped in two layers of 6-mil polyethylene plastic sheeting as it is generated. A sufficient number of waste bags and/or plastic sheeting shall be located in the immediate work area (unused bags in the equipment room of the decontamination facility must be disposed of as contaminated waste). The Contractor shall count or measure the volume of each filled container leaving the work area, and maintain a written record of such.
- B. Warning labels, having waterproof print and permanent adhesive, shall be affixed to the sides of all waste bags or transfer containers. Warning labels shall be conspicuous and legible, and contain the following words in accordance with OSHA 1926.1101:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

In addition to the above, affix 'waste generator label' to include the generator's name and address on each waste container. Waste transport vehicles will have appropriate U.S. Department of Transportation signage on them for transportation of asbestos waste materials.

- C. A fine water spray shall be used to keep the unbagged or unwrapped waste damp at all times.
- D. Sealed waste shall be removed from the work area and stored in an on-site, enclosed, lined, and lockable dumpster or transported to the landfill. The temporary storage dumpster area shall be prominently identified and be kept locked.
- E. Once a truckload of waste containers has accumulated, the Contractor shall arrange for transportation to the landfill. No temporary co-mingling of asbestos waste from this project with that from another site will be allowed.
- F. Waste Transportation and Disposal Regulations:
 - 1. It is the responsibility of the Contractor to determine and ensure compliance with the current waste handling regulations applicable to the work site and the current regulations for waste transportation to and disposal at each ultimate landfill. The Contractor shall comply fully with these regulations and with all U.S. Department of Transportation, EPA, and State of Connecticut Department of Energy and Environmental Protection (CTDEEP) requirements.

2. If required, the Contractor (or Subcontractor), at no additional cost, shall maintain a valid hazardous waste transporter's permit and identification number, and document and fully comply with any hazardous waste manifesting requirements.

G. Waste Disposal Procedure:

1. The Contractor shall incorporate in his/her proposal the estimated quantity of asbestos waste disposal to be generated during the work; the proposed final waste site; the estimated number of separate waste shipments (loads), and the current estimated transportation and landfill disposal fees (per cubic yard). Non-contaminated waste transport and disposal shall be solely the Contractor's responsibility. The Contractor shall review each of these items and resolve any discrepancies or deficiencies during the pre-construction site meeting.
2. The Contractor shall package, label, and remove all asbestos waste as specified in the specifications. Packaging shall be accomplished in a manner that minimizes waste volume, but so that waste containers will not tear or break.
3. The Contractor shall verify the total volume of waste material to be removed from the site (total count of waste containers and total volume estimate to the nearest 0.5 cubic yard), and insert the quantity on the Waste Shipment Record and on a hazardous waste manifest if required.
4. The Contractor shall provide legal transportation of this waste to the ultimate disposal landfill; and have the waste hauler and the landfill owner complete all other required manifests, dump slips, or other forms. The completed and fully signed (by all required parties) original of the Waste Shipment Record, and copies of the other forms, shall be returned within thirty (30) calendar days to the Owner for payment approval. No payments will be approved, or made for incomplete Waste Shipment Records.
5. All disposal of asbestos-containing and/or asbestos-contaminated material must be in compliance with requirements of and authorized by the Solid Waste Management Division, State of Connecticut Department of Energy and Environmental Protection (CTDEEP).

H. Waste Disposal Fees:

1. All Contractor contaminated waste handling costs, such as waste packaging, on-site/off-site storing/handling, transport/disposal, permitting, record keeping, and non-contaminated waste handling must be included in the Contractor's proposal as applicable to removal of asbestos materials and/or performance of the related abatement activities.

3.13 PROJECT RESTORATION

A project walk-through shall be conducted after the abatement portion of the project to identify areas or equipment damaged during the work. If the Owner determines that the damage is caused by acts or omissions of the Contractor, a punch list shall be developed. The Contractor shall be responsible for repair or replacement, or at the discretion of the Owner, payment for the work of another Contractor to complete the punch list. A second walk through shall be conducted after completion of punch list items.

END OF SECTION

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME _____ DATE _____

PROJECT ADDRESS _____

CONTRACTOR'S NAME _____

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the Owner for the above project requires that: You be supplied with the proper respirator and be trained in its use; You be trained in safe work practices and in the use of the equipment found on the job; You receive a medical examination; These things are to have been done at no cost to you.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type respirator to be used on the above referenced project. You must be given a copy of the written respiratory protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above project.

TRAINING COURSE: You must have been trained in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures. The topics covered in the course must have included the following:

- Physical characteristics of asbestos
- Health hazards associated with asbestos
- Respiratory protection
- Use of personal protective equipment
- Pressure Differential Systems
- Work practices including hands on or on-job training
- Personal decontamination procedures
- Air monitoring, personal and area

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no cost to you. This examination must have included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray.

By signing this document you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer, the Contractor.

Signature _____

Printed Name _____

Social Security # _____

Witness _____

The State of Connecticut Department of Housing
Community Development Block Grant
Disaster Recovery Program (CDBG-DR)
Owner Occupied Rehabilitation and Rebuilding Program

Bid Documents
Project# 1111
91 Dogwood Drive
Easton, CT

SECTION 02 83 13

LEAD HAZARD REMEDIATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. 'Lead Hazard Remediation Project, 91 Dogwood Drive' prepared by Gilberto Lead Inspections LLC.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION

All work, labor, and materials shall be accordance with 'Lead Hazard Remediation Project, 91 Dogwood Drive' prepared by Gilberto Lead Inspections LLC.

Part 1 General

1.1 SCOPE

- A. The work specified herein includes lead paint hazard reduction in accordance with The Department of Housing and Urban Development (HUD) Lead Safe Housing Rule (24 CFR 35) for all components and surfaces containing defective toxic levels of lead paint. The work shall be conducted to satisfy the requirements of federal HUD standards. Testing was performed in accordance with HUD and State of Connecticut protocols.

Property Information:

Address: 91 Dogwood Road, Easton, CT
(A single family residence)

Property Owner: Ron Terebisi
91 Dogwood Road, Easton, CT

Lead Testing Performed by:

Maureen Monaco – Lead Inspector /Risk Assessor #1172

Gilbertco Lead Inspections LLC- Consultant Contractor #270
287 Main Street
Ansonia, CT 06401
1-800-959-2985

Date of testing: May 13, 2014

Methodology: Handheld Scitec Map 4 (Keymaster/Bruker) XRF
spectrum analyzer, K Shell emissions

Resident Information:

No persons in residence.

- B. Prior to abatement or interim controls, repair work including but not limited to the repair of any leaks related to the deterioration of lead based painted surfaces is required. None required.
- C. Abatement or Lead Hazard Remediation includes the following methods:
- Replacement by removing components such as windows, doors, and trim that have lead painted surfaces and installing new lead free components.
 - Rigid enclosure using enclosure system by mechanically attaching a rigid durable barrier covering building components with all edges and

seams sealed with caulk or other sealant. Enclosures are intended to prevent access and exposure to lead painted surfaces and provide a “dust –tight” system to trap and lead contaminated dust.

Appropriate enclosure materials include:

<u>Surface Location</u>	<u>Covering Material</u>
Exterior Trim	Aluminum or vinyl coil stock
Exterior Finish	Aluminum or vinyl siding
Interior Finish	Drywall, wainscoting
Steps	Vinyl or rubber tread and riser coverings
Floors	Underlayment and vinyl

- Liquid Encapsulation by application of an approved liquid coating that acts as a barrier between lead based paint and the environment.
- Paint removal by separation of lead paint from the surface of components. This activity may include the following methods when performed with the proper conditions and engineering controls:
 1. Mechanical removal by wet scraping or HEPA needle gun.
 2. Chemical removal by use of strippers in accordance with manufacturer’s specifications.
 3. Heat Gun by heating the painted surface utilizing proper engineering controls and when temperature does not exceed 700 degrees F.
- Soil Hazard Reduction Methods may include
 1. Removal and replacement of lead contaminated soil by removing the top 2-6 inches of lead contaminated soil, disposing it in accordance with federal and state standards and replacing it with new lead free soil. EPA Guidance recommends this method when lead levels exceed 500 ppm.
 2. Permanent Cover of bare soil areas with concrete, asphalt, or other permanent materials; EPA Guidance recommends this method when lead concentrations in soil exceed 5000 ppm.
 3. Interim controls may include covering lead contaminated soil with grass, gravel, mulch, or restrictive elements such as fences, shrubbery, or decking to prevent access to contaminated soil. Interim controls require periodic monitoring to ensure that the cover or controls are in place.

- D. Interim controls may be performed by personnel who have received the Renovate Right Certification from the EPA. Interim Controls are measures designed to temporarily reduce human exposure or likely exposure to lead paint hazards, including specialized cleaning, repairs, maintenance painting, and temporary containments.
- E. The Contractor shall provide all labor, materials, equipment, services, insurance, supervision, and incidentals which are necessary or required to perform the work of lead paint remediation in accordance with applicable governmental regulations and these specifications.
- F. The Contractor is responsible for restoring all auxiliary areas utilized during abatement to conditions equal to or better than original. The contractor shall, at no additional expense to the building owner, repair any damage caused to auxiliary areas during the performance of abatement activities.
- G. The Contractor will protect and preserve in operating conditions, including all utilities transversing the building and site. Damage to any utility due to work under this contract shall be repaired to the reasonable satisfaction and at no cost to the building owner.
- H. The Contractor shall coordinate work schedule and site access with the building owner. The contractor shall submit a schedule of work and shall be approved by the building owner prior to the commencement of work. The contractor shall be responsible for securing the building for the duration of the work.
- I. The Contractor shall be responsible for removing and decontaminating movable objects from the work area. This should be coordinated with the building owner.

1.2 DESCRIPTION OF WORK

- A. The site is a single family residential, ranch style home built about 1951. The exterior of the home is vinyl sided with vinyl replacement windows throughout,
- B. The scope of work includes replacement of the interior garage door trim and rigid encapsulation of exposed fascia board and soffit in the rear of the property.
- C. A CT Licensed Lead Abatement Contractor will be utilized to perform the required work.

- D. All required lead based paint abatement work shall be conducted in compliance with HUD regulation 24 CFR Part 35.
- E. Lead based paint is present on the similar painted components in the areas of the project as found in the inspection report attached. It is the responsibility of the Contractor to comply with the OSHA Construction industry Standard 29 CFR 1926.62 when conducting abatement activities which may disturb materials with lead based paint.

1.3 PERSONAL PROTECTION

- A. Prior to commencement of work, instruct all workers in all aspects of personal protection, work procedures, emergency evacuation procedures and use of all equipment. A formal respiratory protection program including respiratory protection must be implemented in accordance with 29 CFR 1926.26 and 29 CFR 1910.134.
- B. Contractor will provide appropriate respiratory and filters for protection equipment for each worker and ensure usage during potential dust exposure. Respirators shall be approved by the National Institute for Occupational Safety and Health under 30 CFR Part 11.
- C. Contractor will provide and require workers to wear protective clothing in work areas where lead dust concentrations exceed permissible exposure limits established OSHA. This includes impervious coveralls with elastic wrists and ankles, head covering, gloves, and foot coverings.

1.4 PREPARATION OF LEAD CONTROL AREA

- A. Post warning signs meeting EPA Renovate Right Program at each entrance and exit. Notification to tenants or owner must be made in writing.
- B. Install an impermeable cloth or vinyl on ground under work area to collect paint dust, chips, and debris.
- C. Remove movable objects within the proposed work area and enclose those items remaining with a minimum of 6 mil poly, sealed with tape.
- D. Pre-clean proposed work area with HEPA vacuum or wet cleaning methods.

1.5 LEAD REMOVAL

- A. A competent person shall be on the job site at all times to ensure proper work practices are followed.
- B. Utilize wet methods to remove lead based paint and painted components in accordance with 29 CFR 1926.62 utilizing fine mist to moisten surface to prevent lead dust from becoming airborne.
- C. At the end of each work shift remove and place all visible accumulation of paint chips and associated dust and debris. This includes rags, sponges and protective clothing.
- D. The following practices are prohibited:
 - Dry scraping
 - Power tools for grinding, sanding, and cutting without HEPA vacuum dust collection

1.6 CLEAN-UP, VISUAL INSPECTION, FINAL INSPECTION

- A. After a visual inspection, the Contractor will remove impermeable drop cloths.
- B. The contractor will call Gilbertco Lead Inspections LLC (1-800-959-2985) or Facilities Support Services LLC at 1-203-288-1281 to do a visual inspection of the interior and exterior of the project to detect incomplete work, visible debris, or damage cause by abatement or remediation activity.
- C. A visual inspection for bare soil areas will be conducted along the exterior perimeter of the site and in water runoff areas. Bare soil can be covered by 2-4 inches of mulch, gravel, good quality grass, restrictive bushes, cement, asphalt or a combination of these.

1.7 DISPOSAL OF HAZARDOUS LEAD BEARING WASTE

- A. Materials associated with the abatement shall be disposed of as hazardous waste with a TCLP reading >5 mg/l. The contractor shall obtain a small quantity hazardous waste generator ID number from the State of Connecticut DEEP for the site, if hazardous waste generated exceeds 100 kilograms per month. Materials associated with this abatement include:
 - Any lead containing or lead based paint debris
 - Wood painted with lead based paint
 - Stripped paint or paint chips
 - Painted wall or ceiling plaster
 - Painted concrete debris

- B. Disposal of all hazardous waste shall comply with the requirements of Resource Conservation and Recovery Act (RCRA).
- C. Contractor can wipe clean polyethylene sheeting and dispose of it as construction debris.
- D. Dumpsters containing hazardous waste are to be kept covered and locked when not in active use for lading of materials.
- E. All containers of hazardous lead bearing material shall carry the following label in accordance with 29 CFR 1926.62.

HAZARDOUS LEAD WASTE

Federal Law prohibits improper disposal.
If found, contact the nearest police or public safety authority,
or the U.S. Environmental Protection Agency

Generator Information:

Facility Name: _____

Facility Address: _____

Facility Phone Number: _____

EPA ID / Manifest Document #: _____

Accumulation Start Date: _____

EAP Waste #: _____

HAZARDOUS WASTE SOLID NUMBERS

ORM-E NA 9189 D008

HANDLE WITH CARE

- F. Payment for disposal of hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials is returned and a copy is furnished.

SECTION 02 85 00

MOLD REMEDIATION

1. The Contractor shall have a designated Competent Person: on the job at all times to ensure proper work practices throughout the project.
2. Prior to beginning the clean-up and decontamination process, the contractor shall install at a minimum, a one-stage decontamination unit at the entrance to the area.
3. Workers shall don the proper PPE following 29 CFR 1910.120 prior to beginning the removal. This may include respiratory protection and, or disposable full body coveralls.
4. Microbial abatement shall be implemented using the following procedure:
 - a. If visible mold growth is observed:
 - i. Mold contaminated waste materials shall be handled and removed from specified locations for proper disposal.
 - ii. Materials shall be removed in a manner which does not breakdown the materials into fine dust or powder to the extent feasible. Equipment and tools to be utilized shall include hand tools only to remove materials from adjacent substrates.
 - iii. Any dry or brittle materials shall be removed with additional engineering controls such as use of a HEPA vacuum to removed accumulated dust or debris during removal.
 - iv. Waste shall be immediately placed in disposal containers/storage trailers. The containers shall not be emptied into other containers to avoid dispersal of dust or fugitive emissions.
 - v. The use of minimal but sufficient quantities of water to wet the generated waste prior to collection shall be utilized. Under no circumstances shall the mold waste show evidence of free liquid water, pooling or ponding with the waste stream. Any liquid used to wet the dust and debris to control fugitive emission shall be properly containerized and decontaminated in accordance with CHS Section 22a-463 through 22a-469.
 - b. All remaining surfaces that are disturbed during renovation or demolition.
 - i. Spray one coat of Shockwave Disinfectant & Cleaner (or similar) to all surfaces per the manufacturer's specifications. This includes all floors, walls, and ceilings. Alternate products must be approved by the project consultant.
 - ii. Spray one coat of Aftershock fungicidal coating (or similar) to all surfaces per the manufacturer's specifications. This includes all floors, walls, and ceilings. Alternate products must be approved by the project consultant.

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Dimensional Lumber.
- B. Wall, Floor, and Roof Sheathing.
- C. Miscellaneous Lumber.
- D. Related Accessories.

1.2 REFERENCES

- A. American Forest and Paper Association (AF&PA).
- B. American Lumber Standard Committee (ALSC).
- C. American National Standards Institute (ANSI/ASSE).
- D. ASTM International (ASTM).
- E. American Wood Preservers Association (AWPA).
- F. Douglas Fir Protection Association (DFPA).
- G. National Fire Protection Association (NFPA).
- H. National Lumber Grades Authority (NLGA).
- I. Northeastern Lumber Manufacturers Association (NeLMA).
- J. Occupational Safety and Health Administration (OSHA).
- K. Underwriters Laboratories (UL).
- L. West Coast Lumber Inspection Bureau (WCLIB).
- M. Western Wood Products Association (WWPA).

PART 2 PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an

agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
 3. Provide dressed lumber, ss per local and national governing industry standards.
- B. Maximum Moisture Content of Lumber: As per local and national governing industry standards.
- C. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 DIMENSION LUMBER FRAMING

- A. Non-Load-Bearing Interior Partitions: As per local and national governing industry standards.
1. Application: Interior partitions not indicated as load-bearing.
 2. Species:
 - a. Mixed southern pine.
 - b. Northern species.
 - c. Eastern softwoods.
 - d. Western woods.
- B. Framing Other Than Non-Load-Bearing Interior Partitions: As per local and national governing industry standards.
1. Application: Framing other than interior partitions.
 2. Species:
 - a. Hem-fir (north).
 - b. Southern pine.
 - c. Douglas fir-larch.
 - d. Mixed southern pine.
 - e. Spruce-pine-fir.
 - f. Douglas fir-south.
 - g. Hem-fir.
 - h. Douglas fir-larch (north).
 - i. Spruce-pine-fir (south).

2.3 WALL, FLOOR, AND ROOF SHEATHING

- A. Sheathing: As per local and national governing industry standards.
1. Application: Wall sheathing.
 2. Application: Subflooring.

3. Application: Roof decking.
4. Material: Match existing materials or comply with final install product instructions, specified industry standards and recommendations application.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 1. Blocking.
 2. Nailers.
 3. Cants.
 4. Furring.
 5. Grounds.
- B. For items of dimension lumber size, provide lumber per local and national governing industry standards.
- C. For concealed boards, provide lumber per local and national governing industry standards. following species and grades:
 1. Mixed southern pine.
 2. Eastern softwoods.
 3. Northern species.
 4. Western woods.

2.5 FASTENERS

- A. General: Provide fasteners as per local and national governing industry standards.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- D. Do not splice structural members between supports unless otherwise indicated.
- E. Comply with, specified industry standards and recommendations for installation of all applications.

END OF SECTION

SECTION 06 40 00

ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cabinetry and Cabinetry Hardware.
- B. Wood Paneling.
- C. Exterior and Interior Wood Trim and Casing.
- D. Related Accessories.

1.2 REFERENCES

- A. Minimum standards for work in this Section shall be in conformity with the Architectural Woodwork Standards, latest edition, published jointly by the Architectural Woodwork Institute and the Woodwork Institute (AWI).
- B. American National Standards Institute (ANSI/ASSE).
- C. ASTM International (ASTM).
- D. Occupational Safety and Health Administration (OSHA).
- E. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Product Data: For each type of factory-fabricated product.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials only when the project is ready for installation and the general contractor has provided a clean storage area.
 - 1. Delivery of architectural millwork shall be made only when the area of operation is enclosed, all plaster and concrete work is dry and the area broom clean.
 - 2. Maintain indoor temperature and humidity within the range recommended by the Architectural Woodwork Standards for the location of the project.

1.5 WARRANTY

- A. Standard Manufacturers warranty for each type of factory-fabricated product.

PART 2 PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber shall be sound, kiln dried, and in accordance with the Architectural Woodwork

Standards requirements for its use and the Grade specified.

- B. Shall be lumber or sheet products of the species and Grade to match existing materials.
- C. Shall conform in finish width, thickness, and profile of lumber to match existing materials.
- D. Particleboard, MDF, and Plywood shall meet the requirements of the AWS for the Grade specified and their intended.
- E. Veneered components shall be in accordance with the Architectural Woodwork Standards requirements for the Grade specified use.
- F. Adhesives shall meet the requirements of the Architectural Woodwork Standards for its intended use.

2.2 CABINETS

- A. Cabinetry components to match existing, including the following:
 - 1. Shelving configuration.
 - 2. Drawer configuration.
 - 3. Trims, moldings, toe kicks and end panel configuration.
- B. Countertops to match existing, including the following:
 - 1. Cut-out configurations.
 - 2. Backsplash.
 - 3. Plywood substrates.
 - 4. Counter supports.
- C. Cabinetry hardware to match existing, including the following:
 - 1. Pulls.
 - 2. Drawer guides.
 - 3. Hinges.
 - 4. Door catches.
 - 5. Shelf supports.
- D. Plastic Laminates shall meet the requirements of the Architectural Woodwork Standards for its intended use.
- E. All finishes/colors of cabinetry and countertops to match existing.

2.3 EXTERIOR TRIM

- A. Waterproof Type I adhesive is required.
- B. Sheet products shall be of exterior type.
- C. Nails and screws shall be corrosion-resistant.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify the adequacy and proper location of any required backing or support framing.

3.2 INSTALLATION

- A. All work shall be secured in place, square, plumb, and level.
- B. All work abutting other building components shall be properly scribed.
- C. Mechanical fasteners used at exposed and semi-exposed surfaces, excluding installation attachment screws and those securing cabinets end to end, shall be countersunk.
- D. All nicks, chips and scratches shall be sanded out, filled and re-touched. Damaged items which cannot be repaired shall be replaced.

END OF SECTION

SECTION 07 21 00

BUILDING INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Glass-fiber blanket insulation.
- B. Spray Foam insulation.
- C. Vapor Retarders.
- D. Related Accessories.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. ASTM International (ASTM).
- C. North American Insulation Manufacturers Association (NAIMA).
- D. Occupational Safety and Health Administration (OSHA).
- E. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- B. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- C. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging with labeling intact including material name, production date and product code, until ready for installation.
- B. Protect insulation from physical damage and from becoming wet, soiled, or covered with ice or snow.
- C. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
 - 1. CertainTeed Corporation.
 - 2. Guardian Building Products, Inc.
 - 3. Johns Manville.
 - 4. Knauf Insulation.
 - 5. Owens Corning.
 - 6. Reef Industries, Inc.
- B. Substitutions: or equal.
- C. Requests for substitutions will be considered in accordance with Section 01 60 00.
 - 1. When submitting request for substitution, provide complete product data and MSDS sheet for each substitute product.

2.2 GLASS-FIBER BLANKET INSULATION

- A. Unfaced and Kraft Faced Batt Insulation: ASTM C 665, Type I (Unfaced) or Type II (Faced), Class A (Unfaced) or Class C (Faced); non-combustible when tested in accordance with ASTM E 136; extra wide stapling flanges.
 - 1. Physical and Mechanical Properties
 - a. R-value to match existing conditions or meet local building codes. The greater duty or obligation on the R-value shall govern.
 - b. Size: Maximum sizes available, to avoid jointing to greatest extent possible.
 - c. Width for Metal Framing Application: Same as framing center to center dimension.
 - d. Width for Wood Framing Application: Maximum of 1 inch (25 mm) less than framing center to center dimension.
 - e. Vapor Retarder Perm Rating (For Faced Batt Insulation): Maximum 1.0 perms (57 ng/(Pa s sq m)) when tested in accordance with ASTM E 96.
 - f. Surface Burning Characteristics (For Unfaced Batt Insulation): Maximum flame spread of 25, maximum smoke developed of 50, when tested in accordance with ASTM E 84.
 - g. Properties:
 - 1) Free of Formaldehyde: Insulation is manufactured with bio-based binder and no formaldehyde.
 - 2) VOC Emission: Low VOC emission certified by GreenGuard Environmental Institute for Children and Schools.
 - 3) Recycled Content: Minimum of 40% "post-consumer" recycled material.
- B. Accessory Materials and Fasteners: Provide all materials required for complete and proper installation of insulation, whether specified or not.

- C. Polyethylene Vapor Retarders: ASTM D 4397, 6 mils thick, with maximum permeance rating of 0.13 perm.
- D. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by manufacturer for sealing joints and penetrations in vapor retarder.

2.3 SPRAY FOAM INSULATION

- A. Open-Cell and Closed-Cell Spray Foam Insulation: Low density, MDI-based semi-rigid polyurethane water-blown type Open Cell Foam: foam OR Medium-density, MDI-based polyurethane thermoset rigid HFC-blown type Closed Cell Foam:
 - 1. Physical and Mechanical Properties:
 - a. Thermal Performance (Open-Cell AND Closed-Cell): Thicknesses and R-value to match existing conditions or meet local building codes. The greater duty or obligation on the R-value shall govern.
 - b. Core Density: 0.45-0.55pcf (Open-Cell) OR 1.9-2.4pcf (Closed-Cell) when tested in accordance with ASTM D 1622.
 - c. Thermal Resistance: 3.6 (Open-Cell) OR 6.4(Initial) and 5.8(Aged) less than or equal to 2-1/2 inches / 6.4 when greater than 2-1/2 inches (Closed-Cell) when tested in accordance with ASTM C 518.
 - d. Open Cell Content: Greater than 95% when tested in accordance with ASTM D 2842.
 - e. Closed Cell Content: 88-95% when tested in accordance with ASTM D 2842.
 - f. Compressive Strength: Greater than 2.4psi (Open-Cell) OR Greater than 25psi (Closed-Cell) when tested in accordance with ASTM D 1621.
 - g. Tensile Strength: 5.2psi (Open-Cell) OR 23psi (Closed-Cell) when tested in accordance with ASTM D 1623.
 - h. Water Absorption: Less than 30% by volume (Open-Cell) OR Less than 2% by volume (Closed-Cell) when tested in accordance with ASTM D 2842.
 - i. Dimensional Stability: Less than 12% by volume (Open-Cell) OR Less than 9% by volume (Closed-Cell) when tested in accordance with ASTM D 2126
 - j. Water Vapor Transmission: 33 perm/inch (Open-Cell) OR 1.3 perm/inch (Closed-Cell) when tested in accordance with ASTM E 96.
 - k. Air Permeability (Open-Cell AND Closed-Cell): 0.013 when tested in accordance with ASTM E 283.
 - l. Fungi Resistance (Open-Cell AND Closed-Cell): Pass, with no growth when tested in accordance with ASTM C 1338.
 - 2. Fire performance
 - a. Flame Spread (Open-Cell AND Closed-Cell): Less than 25 when tested in accordance with ASTM E 84.
 - b. Smoke: Less than 350 (Open-Cell) OR Less than 450 (Closed-Cell) when tested in accordance with ASTM E 84.
- B. Accessory Materials and Fasteners: Provide all materials required for complete and proper installation of spray foam insulation, whether specified or not.

2.4 VAPOR RETARDERS

- A. Vapor Retarder (Fire Retardant Reinforced, Reinforced, and Standard):
 - 1. Physical and Mechanical Properties:

- a. Material (Minimums): 3-ply fire retardant laminate (Fire Retardant Reinforced) OR 3-ply laminate (Reinforced) OR Extruded polyethylene Film
 - b. Weight (Minimums): 33lbs/1,000sq.ft. (Fire Retardant Reinforced), 40lbs/1,000sq.ft. (Reinforced), 49lbs/1,000sq.ft. (Standard), when tested in accordance with ASTM D 3776.
 - c. Puncture Propagation Tear (Minimums): 26lb (Fire Retardant Reinforced) OR 30lb (Reinforced) OR 34lb (Standard), when tested in accordance with ASTM D 2582.
 - d. Permeance (Perm) (Minimums): 0.062grains/hr-sq ft-in Hg (Fire Retardant Reinforced), 0.038grains/hr-sq ft-in Hg (Reinforced), 0.018grains/hr-sq ft-in Hg (Standard), when tested in accordance with ASTM E 96.
 - e. Drop Dart (Minimums): 450g (Fire Retardant Reinforced), 475g (Reinforced), 2270g (Standard), when tested in accordance with ASTM D 1709.
 - f. Tensile Strength (1" Tensile) (Minimums): 90lb/5050psi (Fire Retardant Reinforced), 35lb/4560 psi (Reinforced), 44lb/4400 psi (Standard), when tested in accordance with ASTM D 882.
 - g. Puncture Strength (Minimums): 30lb (Fire Retardant Reinforced), 35lb (Reinforced), 24lb (Standard), when tested in accordance with ASTM D 4833.
 - h. Usable Temperature Range: Minus 25 to 170 degrees F (minus 32 to 77 degrees C).
 - i. Application(s):
 - 1) Use on roof decks under insulation.
 - 2) Use on exterior walls on inside face of framing.
 - 3) Use under concrete slabs, over aggregate fill.
 - 4) Use under concrete slabs, under aggregate fill.
- B. Accessory Materials and Fasteners: Provide all materials required for complete and proper installation of vapor retarders, whether specified or not.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify that adjacent materials are dry and ready to receive insulation.

3.2 INSTALLATION , GENERAL

- A. Install in accordance with NAIMA "Recommendations for Installation in Residential and Other Light-Frame Construction - Fiber Glass Building Insulation" and manufacturer's instructions.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time
- C. Extend insulation to envelope entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thickness, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.3 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacture's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units
- B. Glass-Fiber Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill cavities formed by framing members. If more than one length is required to fill cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation
 - 4. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:
 - a. With faced blankets having stapling flanges, secure insulation by inset, stapling flanges to sides of framing members
 - b. With faced blankets having stapling flanges, lap blanket over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
- C. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Loose-Fill Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

3.4 INSTALLATION OF VAPOR RETARDERS

- A. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs.
 - 1. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches O.C.
 - 2. Before installing vapor retarders, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
 - 3. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.

- C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- D. Repair punctures or tears in vapor retarder facing by taping. Follow tape manufacturer's application recommendations.
- E. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.
- F. Protect insulation from damage and from becoming wet before, during and after installation.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Silicone Joint Sealants.
- B. Urethane Joint Sealants.
- C. Latex Joint Sealants.
- D. Related Accessories.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. ASTM International (ASTM).
- C. Occupational Safety and Health Administration (OSHA).
- D. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Manufacturer's data sheets on each product to be used, including:
 - 1. Material descriptions, dimensions, and profiles.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- C. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.5 WARRANTY

- A. Provide Manufacturer's standard warranty.

PART 2 PRODUCTS

2.1 SILICONE JOINT SEALANTS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available

manufactures offering products that may incorporated into the Work include the following:

1. BASF Building Systems.
 2. Dow Corning Corporation.
 3. GE Advanced Materials - Silicones.
 4. May National Associates, Inc.
 5. Pecora Corporation.
 6. Polymeric Systems, Inc.
 7. Schnee-Morehead, Inc.
 8. Sika Corporation; Construction Products Division.
 9. Tremco Incorporated.
- B. Type: Single component (S).
- C. Grade: Pourable (P).
- D. Class: 100/50.
- E. Uses Related to Exposure: Traffic (T) and Nontraffic (NT).

2.2 URETHANE JOINT SEALANTS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
1. BASF Building Systems.
 2. Bostik, Inc.
 3. Lymtal. International. Inc.
 4. May National Associates, Inc.
 5. Pacific Polymers International. Inc.
 6. Pecora Corporation.
 7. Polymeric Systems, Inc.
 8. Schnee-Morehead, Inc.
 9. Sika Corporation; Construction Products Division.
 10. Tremco Incorporated.
- B. Type: Single component (S).
- C. Grade: Pourable (P).
- D. Class: 100/50.
- E. Uses Related to Exposure: Traffic (T) and Nontraffic (NT).

2.3 LATEX JOINT SEALANTS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
1. BASF Building Systems.
 2. Bostik, Inc.
 3. May National Associates, Inc.
 4. Pecora Corporation.
 5. Schnee-Morehead, Inc.

6. Tremco Incorporated.

B. Latex: Acrylic latex or siliconized acrylic latex.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 1 EXECUTION

1.1 PREPERATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

1. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

1.1 INSTALLATION

A. Install sealant types compatible with adjacent surfaces, materials, and finishes to which sealant may come in contact with.

B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.

2. Do not stretch, twist, puncture, or tear sealant backings.

3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- F. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION

SECTION 09 26 00

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Gypsum Board and Joint Treatments.
- B. Mold and Mildew Resistant Gypsum Board.
- C. Related Accessories.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. ASTM International (ASTM).
- C. Gypsum Association (GA).
- D. Occupational Safety and Health Administration (OSHA).
- E. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.
- B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
 - 1. American Gypsum.
 - 2. CertainTeed Gypsum, Inc.
 - 3. Georgia-Pacific Gypsum
 - 4. National Gypsum Co.
 - 5. Pabco Gypsum, Inc.
 - 6. USG Corporation.
- B. Substitutions: or equal.
- C. Requests for substitutions will be considered in accordance with Section 01 60 00.
 - 1. When submitting request for substitution, provide complete product data and MSDS sheet for each substitute product.

2.2 GYPSUM PRODUCTS, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area that correspond with the support system indicated.
- B. Recycled Content: Provide gypsum panel products with recycled content such that post consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum 50 percent by weight.

2.3 INTERIOR GYPSUM MATERIALS

- A. Regular Gypsum Board: Gypsum core panel surfaced with paper on front and back edges and complying with ASTM C 1396 and ASTM C 36.
 - 1. Thickness: 1/2 inch (12.7 mm), unless otherwise indicated.
 - 2. Width: 48 inches (1219 mm).
 - 3. Length: Use longest length available, avoiding unnecessary joints.
 - 4. Edges: Use square, rounded tapered, or tapered per required application.
- B. Regular Mold Resistant Gypsum Board: Gypsum core panel enhanced with moisture-resistant wax emulsion and chemically treated to resist mold and mildew in the core and surfaced with mold and mildew resistant paper on front, back and long edges and complying with ASTM C 1396 Section 7 and ASTM C 630.
 - 1. Thickness: 1/2 inch (12.7 mm), unless otherwise indicated.
 - 2. Width: 48 inches (1219 mm).
 - 3. Length: Use longest length available, avoiding unnecessary joints.
 - 4. Edges: Use square, rounded tapered, or tapered per required application.
 - 5. Mold and Mildew Resistance: Panel score of 10 when tested in accordance with ASTM D 3273.

2.4 GYPSUM JOINT TREATMENT AND FINISH PRODUCTS

- A. Joint Treatment Tape: Complying with ASTM C 475 and GA-216.

- B. Joint Compound: Vinyl type pre-mixed compound; complying with ASTM C 475.
- C. Joint Compound: Level Five vinyl type pre-mixed compound; off-white color or tinted gray color; complying with ASTM C 475 and fulfilling ASTM C 840; designed for joint finishing of Level Five gypsum board.

2.5 ACCESSORY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Corner Bead: Formed galvanized steel angle, min. base steel 0.014 in. thick, and complying with ASTM C 1047.
- C. Casing Bead: Formed galvanized steel or vinyl trim, matching existing application and complying with ASTM C 1047, type(s) as follows:
 - 1. J-shaped U-bead, for face nailing and finishing with joint treatment.
 - 2. J-shaped U-bead, requiring no finishing.
 - 3. L-shaped, for application over edge and finishing with joint treatment.
- D. Control Joint: Extruded vinyl formed with V-shaped slot covered with removable flexible vinyl strip; complying with ASTM C 1047.
- E. Control Joint: Bent zinc sheet formed with V-shaped slot, covered with plastic tape, with perforated flanges; complying with ASTM C 1047.
- F. Screws: ASTM C 954 or ASTM C 1002 or both with heads, threads, points, and finish as recommended by panel manufacturer.
- G. Nails: ASTM C 514 with heads, lengths, configurations, and finish as recommended by panel manufacturer.
- H. Acoustical Sealant: Nondrying, nonhardening, nonskinning, nonstaining, nonbleeding, gunnable type as recommended by panel manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.2 INSTALLATION

- A. Application: Apply and maintain conditions during installation in accordance with GA-216 and GA-238 and as follows:
 - 1. Keep gypsum board dry throughout application.
 - 2. Do not use gypsum board that has visible mold growth.
 - 3. Apply gypsum board on walls with a minimum 1/4 inch (6.4 mm) gap between the gypsum board and the floor.
 - 4. Do not apply gypsum board over other building materials where conditions exist that are favorable to mold growth.

5. Maintain a sound weather-tight building envelope including, such elements as the roof, sealants, windows, etc.
 6. Immediate and appropriate remediation measures must be taken as soon as water leaks or condensation sources are identified.
 7. If gypsum board is damaged by water, assess the need for replacement in accordance with GA-231.
- B. Install accordance with GA 216 and the following:
1. Gypsum Sheathing Board: ASTM C 1280 and GA-253.
 2. Gypsum Board and Joint Treatment: ASTM C 840 and GA-214.
 3. Gypsum panel manufacturer's published recommendations.
- C. Finishing: Tape, fill, sand and finish joints in accordance with ASTM C 840 and GA-214.
1. Level 2: Water resistant gypsum backing board indicated to receive tile.
 2. Level 4: Gypsum board indicated to receive light textured coatings and light-grade wall coverings.
 3. Level 5: All other gypsum board.

END OF SECTION

SECTION 09 30 00

TILING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Floor and Wall Tile.
- B. Trims.
- C. Tile Setting Materials.
- D. Related Accessories.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. ASTM International (ASTM).
- C. Occupational Safety and Health Administration (OSHA).
- D. Underwriters Laboratories (UL).
- E. Tile Council of North America (TCNA).

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- D. Selection Samples: Submit a complete set of tile samples that represent the full range of manufacturer's products, colors and patterns available.
- E. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging until ready for installation.
- B. Protect adhesives and liquid additives from freezing or overheating in accordance with

manufacturer's instructions.

- C. Store tile and setting materials on elevated platforms, under cover and in a dry location and protect from contamination, dampness, freezing or overheating.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
 - 1. American Olean Tile Co.
 - 2. Daltile Corporation.
 - 3. Interceramic Inc.
 - 4. Merola Tile.
- B. Substitutions: or equal.
- C. Requests for substitutions will be considered in accordance with Section 01 60 00.
 - 1. When submitting request for substitution, provide complete product data and MSDS sheet for each substitute product.

2.2 TILE, GENERAL

- A. Tile shall also be provided in accordance with the following:
 - 1. Factory Blending: For tile exhibiting color variations within the ranges selected under Submittal of samples, blend tile in the factory and package so tile taken from one package shows the same range of colors as those taken from other packages.
 - 2. Mounting: For factory mounted tile, provide back or edge mounted tile assemblies as standard with the manufacturer, unless otherwise specified.
 - 3. Factory Applied Temporary Protective Coatings: Where existing, to match, protect exposed surfaces of tile against adherence of mortar and grout by precoating with a continuous film of petroleum paraffin wax applied hot. Do not coat unexposed tile surfaces.

2.3 FLOOR AND WALL TILE

- A. Product: Match existing materials with best efforts.
- B. Size and Shape: Match existing materials.
- C. Surface Finish: Match existing materials.
- D. Colors: Match existing materials.
- E. Pattern: Match existing materials.
- F. Trim Units: Matching bullnose, bullnose corner, cove/inside finger cove, radius cap, sink rail, sink rail incorner/outcorner, cove base, outside cove corner, Cement Bullnose, Cove Base, Cove Base Corner, Fabric Bullnose, Groover Bullnose shapes in sizes coordinated with field tile shapes.

2.4 TRIM AND ACCESSORIES

- A. Ceramic Accessories: Match existing finish, same color and finish as adjacent field tile; same manufacturer as tile.
 - 1. Soap Dish: With wash cloth holder, clam shell design, surface mounted or recessed; cast strength sufficient to resist lateral pull force of 75 lbs (34 Kg).
 - 2. Toilet Tissue Holder: Surface mounted or recessed, for single roll, with spring loaded holder.
 - 3. Towel Bars: Standard design, surface mounted with extensions for casting into small wall openings; cast strength sufficient to resist lateral pull force of 30 lbs (14 Kg).
 - 4. Corner Shelf.
- B. Non-Ceramic Trim: Match material, finish, style and dimensions as existing and to suit application, for setting using tile mortar or adhesive; use in the following locations:
 - 1. Open edges of floor tile.
 - 2. Transition between floor finishes of different heights.
 - 3. Thresholds at door openings.
 - 4. Expansion and control joints, floor and wall.
- C. Stone Thresholds: Provide stone thresholds uniform in color and finish and fabricated to match existing material type, size and finish.
 - 1. Provide to provide transition between tile surface and adjoining finishes where required.

2.5 SETTING MATERIALS

- A. Organic or Epoxy Adhesive: Thinset per Manufacturer requirements.
- B. Mortar Bed Materials: Match existing materials or per Manufacturer requirements.
- C. Mortar Bond Coat Materials: Match existing materials or per Manufacturer requirements.
- D. Standard Grout: Cement grout, sanded or unsanded, as specified by Manufacturer; color to match existing.
- E. Polymer modified cement grout, sanded or unsanded, as specified by Manufacturer; color to match existing.
- F. Epoxy Grout: As specified by Manufacturer; color to match existing.
- G. Silicone Sealant: Silicone sealant, moisture and mildew resistant type, as specified by Manufacturer; color to match existing.
- H. Waterproofing membranes: Match existing materials or per Manufacturer requirements.
- I. Cementitious Backer Board: Match existing materials or per Manufacturer requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that wall surfaces are free of substances which would impair bonding of setting materials, smooth and flat within tolerances specified by Manufacturer, and are ready to receive tile.
- B. Verify that sub-floor surfaces are dust-free, and free of substances which would impair bonding of setting materials to sub-floor surfaces, and are smooth and flat within tolerances specified by Manufacturer.

3.2 INSTALLATION

- A. Preparation: Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.
 - 1. Remove any curing compounds or other contaminates.
 - 2. Vacuum clean surfaces and damp clean.
 - 3. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
 - 4. Install cementitious backer board in accordance with Manufacturer requirements and board manufacturer's instructions. Tape joints and corners, cover with skim coat of dry-set mortar to a feather edge.
- B. Install tile, grout and setting materials in accordance with applicable requirements of manufacturer's instructions, and TCA Handbook recommendations.
- C. Lay tile to pattern to match existing application. Arrange pattern so that a full tile or joint is centered on each wall and that no tile less than 1/2 width is used. Do not interrupt tile pattern through openings.
- D. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- E. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
- F. Install non-ceramic trim in accordance with manufacturer's instructions.
- G. Install thresholds where required.
- H. Sound tile after setting. Replace hollow sounding units.
- I. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
- J. Allow tile to set for a minimum of 48 hours prior to grouting.
- K. Grout tile joints. Use standard grout unless otherwise indicated.
- L. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.
- M. Comply with the manufacturer's instructions, specified industry standards and recommendations for cleaning, traffic, furnishings installation and equipment installation.

END OF SECTION

SECTION 09 64 00

WOOD FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Solid Hardwood Flooring.
- B. Engineered Hardwood Flooring.
- C. Flooring Underlayment.
- D. Related Accessories.

1.2 REFERENCES

- A. Minimum standards for work in this Section shall be in conformity with the National Wood Flooring Association Installation Guidelines, latest edition (NWFA).
- B. American National Standards Institute (ANSI/ASSE).
- C. ASTM International (ASTM).
- D. Occupational Safety and Health Administration (OSHA).
- E. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Manufacturer's data sheets on each product to be used, including:
 - 1. Material descriptions, dimensions, and profiles.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- C. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- D. Selection Samples: Submit a complete set of floor profiles that represent the full range of manufacturer's products, colors and finish available.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store Products in a fully enclosed, ventilated, clean and dry storage space, located in areas of installation for minimum of 24 hours prior to commencing work.

- B. Environmental Requirements:
 - 1. Do not install Products until wet construction work is completed and ambient air at installation space has moisture content stabilized.
 - 2. Maintain room temperature at 65 degrees F and 35 to 55 percent relative humidity for 3 to 5 days prior to delivery of materials, during installation, and after installation.
 - 3. Maintain minimum temperature of 65 degrees], and maintain relative humidity between 40 and 50% within area of installation until final acceptance.

1.5 WARRANTY

- A. Standard Manufacturers warranty for each type of factory-fabricated product.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. MANUFACTURERS: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
 - 1. Anderson Hardwood Floors.
 - 2. Armstrong World Industries.
 - 3. Millstead Wood Flooring.
 - 4. Mohawk Industries.
 - 5. USFloors Inc.
- B. Substitutions: or equal.
- C. Requests for substitutions will be considered in accordance with Section 01 60 00.
 - 1. When submitting request for substitution, provide complete product data and MSDS sheet for each substitute product.

2.2 FLOORING MATERIALS, GENERAL

- A. Hardwood shall meet grading requirements of NOFMA and NWFA. Provide species and grade stamp on underside of each piece of flooring.

2.3 SOLID HARDWOOD FLOORING

- A. Species: Match existing materials.
- B. Grade: Match existing materials.
- C. Finish:
 - 1. Factory Finish: Match existing, as approved by Owner.
 - 2. Field Finish: Match existing color and coats, as approved by Owner.
- D. Thickness: Match existing materials.
- E. Board Width: Match existing materials.
- F. Edging: Match existing materials.

2.4 ENGINEERED HARDWOOD FLOORING

- A. Species: Match existing materials.
- B. Grade: Match existing materials.
- C. Finish:
 - 1. Factory Finish: Match existing, as approved by Owner.
 - 2. Field Finish: Match existing color and coats, as approved by Owner.
- D. Thickness: Match existing materials.
- E. Board Width: Match existing materials.
- F. Edging: Match existing materials.

2.5 GLUELESS ENGINEERED HARDWOOD FLOORING

- A. Species: Match existing materials.
- B. Grade: Match existing materials.
- C. Finish:
 - 1. Factory Finish: Match existing, as approved by Owner.
 - 2. Field Finish: Match existing color and coats, as approved by Owner.
- D. Thickness: Match existing materials.
- E. Board Width: Match existing materials.
- F. Edging: Match existing materials.

2.6 ACCESSORIES

- A. Subfloor Filler:
 - 1. Wood putty: Per Manufacturer's specifications, if required.
 - 2. Floor leveling compound: Per Manufacturer's specifications, if required.
- B. Vapor Barrier:
 - 1. Asphalt-saturated #15 felt (tar paper): Per Manufacturer's specifications, if required.
 - 2. Rosin paper: Per Manufacturer's specifications, if required.
- C. Hardwood Trim: Stair Nosing, Reducer, T-molding, Quarter Round, Threshold, Carpet Molding; matching wood species, color and finish to match existing.
- D. Nails: Purpose designed barbed nails for power nailing or as recommended by Manufacturer
- E. Staples: Purpose designed staples for power stapling or as recommended by Manufacturer
- F. Adhesive: As recommended by Manufacturer.

2.7 FLOORING UNDERLAYMENT

- A. Materials:
 - 1. Plywood: Use CDX grade, matching existing thickness.
 - 2. Foam: As required per Manufacturer's requirements, matching existing thickness.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify wood subfloor is properly secured, is smooth and flat, free of oil, grease, dust, and foreign substance. Ensure that all nail heads are set flush with or below surface.
- B. Comply with the manufacturer's instructions, specified industry standards and recommendations for acceptable subfloor conditions.

3.2 INSTALLATION

- A. Prepare subfloor with the manufacturer's instructions, specified industry standards and recommendation.
- B. Lay flooring parallel to walls and perpendicular or at a 45 degree angle to the direction of the floor joists, to a pattern that matches existing or as per Manufacturer requirements.
- C. Set flooring boards flush and tight.
- D. Provide divider/reducer boards at centerline of door openings and where flooring terminates.
- E. Provide expansion space at walls and other interruptions as per Manufacturer requirements.
- F. Protect finished floor from abuse by other trades using heavy Kraft paper or equivalent. Keep traffic out of spaces and areas where flooring is being installed until adhesive has set.
- G. Comply with the manufacturer's instructions, specified industry standards and recommendations for cleaning, traffic, furnishings installation and equipment installation.

END OF SECTION

SECTION 09 90 00

PAINTS AND COATINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior Paint and Coatings Systems Including Surface Preparation.
- B. Exterior Paint and Coatings Systems Including Surface Preparation.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. ASTM International (ASTM).
- C. Master Painters Institute (MPI)
- D. Occupational Safety and Health Administration (OSHA).
- E. Painting and Decorating Contractors of America (PDCA).
- F. The Society for Protective Coatings (SSPC).
- G. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Product Data: For each paint system indicated, including.
 - 1. Product characteristics.
 - 2. Surface preparation instructions and recommendations.
 - 3. Primer requirements and finish specification.
 - 4. Storage and handling requirements and recommendations.
 - 5. Application methods.
 - 6. Cautions for storage, handling and installation.
- B. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacturer's products, colors and sheens available.
- D. Coating Maintenance Manual: upon conclusion of the project, the Contractor or paint manufacture/supplier shall furnish a coating maintenance manual. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.
- E. Field Coating of Vinyl Siding Methods and Procedures:

1. Manufacturer Guarantee: Submit letter from Manufacturer with acceptable product and application methods for coatings used on vinyl siding systems.
2. Quality Assurance Plan: Submit methods and procedure plan for protection of adjacent environmental items, equipment, vehicles, adjacent structures, etc.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information.
 1. Product name, and type (description).
 2. Application and use instructions.
 3. Surface preparation.
 4. VOC content.
 5. Environmental handling.
 6. Batch date.
 7. Color number.
- B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

1.5 EXTRA MATERIALS

- A. Furnish Owner with any unused materials. Properly seal canisters and label with finish and finish location for proper Owner storage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
 1. BEHR Process Corporation.
 2. Benjamin Moore & Co.
 3. Dunn-Edwards Corporation.
 4. The Sherwin-Williams Company.
- B. Substitutions: or equal.
- C. Requests for substitutions will be considered in accordance with Section 01 60 00.
 1. When submitting request for substitution, provide complete product data and MSDS sheet for each substitute product.

2.2 PAINT MATERIALS - GENERAL

- A. Paints and Coatings.
 1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless

- such procedure is specifically described in manufacturer's product instructions.
2. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color. Or follow manufactures product instructions for optimal color conformance.
- B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
 - C. Coating Application Accessories: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.
 - D. Application to Materials: Apply paints and coatings manufacturer's specifications for application to Wood, Drywall, Plaster, Metals, etc.
 - E. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.
 - F. Color: Refer to existing finishes or as selected by Owner.

2.3 INTERIOR PAINT SYSTEMS

- A. Interior Painting:
 1. Finish: Gloss, Semi-Gloss, Satin or Flat to match existing. If matching is not required, finish per Manufacturer or industry requirements for interior applications.
 2. Coats: Apply quantity of coats to match existing. If matching is not required, finish per Manufacturer or industry requirements for interior applications.
- B. Interior Primers/Sealers:
 1. Interior primers/sealers to be latex or as per Manufacturer/Industry requirements for interior applications.
- C. Interior Wood Sealers:
 1. Wood primers to be latex or as per Manufacturer/Industry requirements for interior applications.

2.4 EXTERIOR PAINT SYSTEMS

- A. Exterior Painting:
 1. Finish: Gloss, Semi-Gloss, Satin or flat to match existing. If matching is not required, finish per Manufacturer or industry requirements for exterior applications.
 2. Coats: Apply quantity of coats to match existing. If matching is not required, finish per Manufacturer or industry requirements for exterior applications.
- B. Exterior Primers/Sealers:
 1. Water based primers/sealers to be alkali resistant and/or bonding or as per Manufacturer or industry requirements for exterior applications.
- C. Exterior Wood Sealers:
 1. Wood primers to be alkyd and/or latex or as per Manufacturer or industry requirements for exterior applications.

- D. Vinyl Siding:
 - 1. Primers and finishes as per manufacturer or industry requirements for vinyl application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared; notify Architect of unsatisfactory conditions before proceeding. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- B. Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.
 - 1. Previously Painted Surfaces: Verify that existing painted surfaces do not contain lead based paints, notify Architect immediately if lead based paints are encountered.

3.2 SURFACE PREPARATION

- A. General: Surfaces shall be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
 - 1. Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry a minimum of 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.
 - 2. Remove items including but not limited to thermostats, electrical outlets, switch covers and similar items prior to painting. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
 - 3. No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50 degrees F (10 degrees C), unless products are designed specifically for these conditions. On large expanses of metal siding, the air, surface and material temperatures must be 50 degrees F (10 degrees F) or higher to use low temperature products.
- B. Drywall - Interior: Must be clean and dry. All nail heads must be set and spackled. Joints must be taped and covered with a joint compound. Spackled nail heads and tape joints must be sanded smooth and all dust removed prior to painting.
- C. Plaster: Must be allowed to dry thoroughly for at least 30 days before painting, unless the products are designed to be used in high pH environments. Room must be ventilated while drying; in cold, damp weather, rooms must be heated. Damaged areas must be repaired with an appropriate patching material. Bare plaster must be cured and hard. Textured, soft, porous, or powdery plaster should be treated with a solution of 1 pint household vinegar to 1 gallon of water. Repeat until the surface is hard, rinse with clear water and allow to dry.
- D. Vinyl Siding, Architectural Plastics, EIFS and Fiberglass: Clean vinyl siding thoroughly by

scrubbing with a warm, soapy water solution. Rinse thoroughly. Do not paint vinyl siding with any color darker than the original color unless approved by Manufacturer.

- E. Wood: Must be clean and dry. Prime and paint as soon as possible. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth.

3.3 INSTALLATION

- A. Apply all coatings and materials with the manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendations.
- B. Apply primer to all materials receiving a finish coat of paint.
- C. Do not apply to wet or damp surfaces. Wait at least 30 days before applying to new concrete or masonry. Or follow manufacturer's procedures to apply appropriate coatings prior to 30 days. Test new concrete for moisture content. Wait until wood is fully dry after rain or morning fog or dew.
- D. Apply coatings using methods recommended by manufacturer and uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.
- E. Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness. Regardless of number of coats specified, apply as many coats as necessary for complete hide, and uniform appearance.
- F. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.
- G. Comply with the manufacturer's instructions, specified industry standards and recommendations for cleaning, traffic, furnishings installation and equipment installation.

END OF SECTION

SECTION 09 93 00

STAINING AND TRANSPARENT FINISHING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Exterior Coating With Transparent and Semi-Transparent Finishes.
- B. Interior Coating With Transparent and Semi-Transparent Finishes.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. ASTM International (ASTM).
- C. Occupational Safety and Health Administration (OSHA).
- D. The Society for Protective Coatings (SSPC).
- E. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Product Data: For each paint system indicated, including.
 - 1. Product characteristics.
 - 2. Surface preparation instructions and recommendations.
 - 3. Primer requirements and finish specification.
 - 4. Storage and handling requirements and recommendations.
 - 5. Application methods.
 - 6. Cautions for storage, handling and installation.
- B. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacturer's products, colors and sheens available.
- D. Coating Maintenance Manual: upon conclusion of the project, the Contractor or paint manufacture/supplier shall furnish a coating maintenance manual. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information.
 - 1. Product name, and type (description).

2. Application and use instructions.
 3. Surface preparation.
 4. VOC content.
 5. Environmental handling.
 6. Batch date.
 7. Color number.
- B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

1.5 EXTRA MATERIALS

- A. Furnish Owner with any unused materials. Properly seal canisters and label with finish and finish location for proper Owner storage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
1. Dura Seal.
 2. Minwax Company.
 3. Rust-Oleum Corporation.
 4. The Sherwin-Williams Company.
 5. United Gilsonite Laboratories.
- B. Substitutions: or equal.
- C. Requests for substitutions will be considered in accordance with Section 01 60 00.
1. When submitting request for substitution, provide complete product data and MSDS sheet for each substitute product.

2.2 STAIN MATERIALS - GENERAL

- A. Stains and Coatings - General:
1. Unless otherwise indicated, provide factory-mixed materials. Mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials unless such procedure is specifically described in manufacturer's product instructions.
 2. Supply each material in quantity required to complete entire project's work from a single production run.
- B. Back Primer for Transparent-Finished Woodwork:
1. Same as finish coat.
 2. 1 coat nitrocellulose lacquer sanding sealer (for use under lacquer).
 3. 1 coat vinyl toluene copolymer(for use under polyurethane).

- C. Wood Filler: Use products as appropriate to repair per Manufacturer's instructions.
- D. Stain Touch-Up: Use products as appropriate to repair per Manufacturer's instructions.
- E. Shellac, Lacquer, and Varnish Remover: Use products as appropriate to repair per Manufacturer's instructions.
- F. Application Accessories: Provide all primers, sealers, cleaning agents, tools, cleaning cloths, sanding materials, and clean-up materials required and per Manufacturer recommendations.

2.3 INTERIOR FINISH SYSTEMS

- A. Interior Wood:
 - 1. Finish: Low Luster, Satin, Semi-Gloss, or High-Gloss to match existing. If matching is not required, finish per Manufacturer or industry requirements for interior applications.
 - 2. Coats: Apply quantity of coats to match existing. If matching is not required, finish per Manufacturer or industry requirements for interior applications.
 - 3. Color: Match existing and per Owner's approval.

2.4 EXTERIOR PAINT SYSTEMS

- A. Exterior Wood:
 - 1. Finish: Gloss, Semi-Gloss, Satin or flat to match existing. If matching is not required, finish per Manufacturer or industry requirements for exterior applications.
 - 2. Coats: Apply quantity of coats to match existing. If matching is not required, finish per Manufacturer or industry requirements for exterior applications.
 - 3. Color: Match existing and per Owner's approval.

2.5 EXAMINATION

- A. Do not begin application of coatings until substrates have been properly prepared.

2.6 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

2.7 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Stir before and during application as recommended by manufacturer.
- C. Do not apply to wet or damp surfaces.
- D. Apply using methods recommended by manufacturer.
- E. Apply without runs, drips, or sags, without brush marks, and with consistent sheen.

- F. Apply at spreading rate required to achieve the manufacturer's recommended film thickness.
- G. Regardless of number of coats specified, apply as many coats as necessary for complete hide, and uniform appearance.
- H. Exterior Woodwork: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 2 weeks.
- I. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.
- J. Comply with the manufacturer's instructions, specified industry standards and recommendations for cleaning, traffic, furnishings installation and equipment installation.

END OF SECTION

SECTION 22 00 50

BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, apply to work of this Section.

1.2 INCLUDED IN THIS SECTION:

- A. General Requirements for Mechanical Work
- B. Nameplates
- C. Access Doors
- D. Tags and Charts
- E. Electrical Motors
- F. Electric Motor Starters
- G. Sleeves, Inserts and Anchor Bolts
- H. Firestopping
- I. Plastic Pipe Markers

1.3 DESCRIPTION OF WORK:

- A. This Section specifies general requirements for mechanical work. Definitions, intent, drawings, interpretation of documents, approvals, submittals, substitutions, code requirements, permits, fees, royalties, patents, record drawings, instruction of Owner's personnel, and warranty are described.
- B. Operation and maintenance manuals shall be submitted to the Architect prior to the scheduled instruction of Owner's representatives. These manuals shall contain equipment lists, manufacturer's literature, valve charts, and time schedule for recommended maintenance.
- C. Brass tags shall be securely attached to each valve. Valve charts shall list each valve and describe its function. One copy of each valve chart shall be placed under glass, framed, and hung in a conspicuous location in the main mechanical equipment room.
- D. Plastic pipe markers shall be provided on exterior of piping for identification purposes. These markers shall be manufacturer's standard pre-printed, color-coded, pressure-sensitive vinyl type.

1.4 DEFINITIONS:

- A. "Provide" means to supply, erect, install, and connect up in complete readiness for regular operation, the particular work referred.
- B. "Furnish" means to supply and deliver to the job.
- C. "Install" means to erect, install and connect up in complete readiness for regular operation.
- D. "Conduit" includes, in addition to conduit, all fittings, sleeves, connections, hangers, and other accessories related to such conduit.
- E. "Wiring" means, in addition to wire, all needed connectors, circuit breakers, switches and devices, junction boxes and other items necessary for normal operation of the item being referred to.
- F. "Piping" includes, in addition to pipe, all fittings, valves, hangers, and other accessories related to such piping.
- G. "Concealed" means hidden from sight, as in chases, furred spaces, shafts, hung ceilings, or embedded in construction.
- H. "Exposed" means not concealed as defined above. Trenches, crawl spaces, and tunnels shall be considered exposed.
- I. "Governmental" means all municipal, state, and federal governmental agencies.
- J. "Owner" means the property owner, Ronald Terebisi, Jr., who shall take occupancy of the space after final acceptance.
- K. "Extend" means to supply, erect, install and connect up on complete readiness for regular operation the particular work referred.
- L. "Architect" shall mean Martinez Couch & Associates, LLC.

1.5 INTENT:

- A. It is the intention of the Drawings and Specifications to call for finished work, tested and ready for operation. All materials, equipment and apparatus shall be new and of first class quality.
- B. Any apparatus, appliance, material, or work not shown on the Drawings, but mentioned in the Specifications, or vice versa, or any incidental accessories, or minor details not shown, but necessary to make the work complete and perfect in all respects, and ready for operation, even if not particularly specified, shall be provided by the Contractor without additional expense to the Owner.
- C. With the submission of bid, the Contractor shall give written notice to the Architect of any materials, apparatus or omissions believed to be in violation of laws, ordinances, rules or regulations or authorities having jurisdiction. In the absence of such written notice it is mutually agreed that the Contractor shall include the cost of providing all systems in accordance with applicable regulations without extra compensation.

1.6 DRAWINGS:

- A. The Drawings are generally diagrammatic and are intended to convey the scope of work and indicate general arrangement of equipment, ducts, conduits, piping, fixtures and connections.
- B. Consider architectural and structural drawings part of this work insofar as these drawings furnish information relating to design and construction of the building.
- C. The Drawings do not indicate all offsets, fittings, and accessories which may be required. Investigate structural and finish conditions affecting this work, and arrange work accordingly, providing such fittings, valves, and accessories required to meet the conditions.
- D. The locations of all items shown on the Drawings or called for in the Specifications, that are not definitely fixed by dimensions, are approximate only. The exact locations necessary to secure the best conditions and results must be determined at the project, and shall have the approval of the Architect before being installed. DO NOT SCALE DRAWINGS.
- E. Follow Drawings as closely as actual building conditions will permit in laying out work. Check Drawings for other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions throughout. Where headroom or space conditions appear inadequate, the Architect shall be notified before proceeding with installation.
- F. If directed by the Architect, the Contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.

1.7 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS:

- A. Any questions or disagreements arising as to the true intent of this Specification or the Drawings, or the kind and quality of work required thereby, shall be decided by the Architect, whose interpretations thereof shall be final, conclusive and binding on all parties.
- B. In the case of disagreement between Drawings and Specifications, or within either document itself, the better quality, greater quantity or more costly work shall be included in the contract price, and the matter referred to the Architect's attention for decision and/or adjustment.

1.8 APPROVALS:

- A. The materials, workmanship, design and arrangement of all work installed under the Contract shall be subject to the approval of the Engineer. If material or equipment is installed before it is approved, the Contractor shall be liable for removal and replacement, at no extra cost to the Owner, if, in the opinion of the Architect, the material or equipment does not meet the intent of the Drawings and Specifications.

1.9 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES:

- A. The Contractor shall submit five (5) copies of Shop Drawings, Product Data and/or Samples to the Architect for review prior to releasing an order for fabrication and/or shipment. These submittals shall be given for materials and equipment and as called for under each particular Section of the Specifications.
- B. Product Data submittals shall consist of complete catalog data clearly indicating all applicable items, in the following manner:
 - 1. State sizes, capacities, brand names, motor HP, accessories, materials, gauges, dimensions, and other pertinent information.
 - 2. List on catalog covers page numbers of submitted items.
 - 3. Underline applicable data. Highlighting applicable data is not sufficient.
- C. Incomplete or unclear submittals will be returned unreviewed for correction and resubmission. Additional copies beyond five (5), or submittals of items other than what is called for under each particular Section, will be returned unreviewed.
- D. Submittals of equipment or materials other than those indicated on the Drawings or in the Specifications will be returned unreviewed, except for reasons as noted under SUBSTITUTIONS.

1.10 SUBSTITUTIONS:

- A. Substitutions of equipment or materials other than those shown on the Drawings or called for in the Specifications will be considered for review only under one or more of the following conditions.
 - 1. Less than three (3) acceptable manufacturers are indicated on the Drawings or in the Specifications.
 - 2. Substitution is required for compliance with subsequent interpretations of code requirements or insurance regulations.
 - 3. Substitution is required due to unavailability of special products, through no fault of the Contractor. Excluded is lack of availability within a desired time frame due to Contractor's failure to order equipment or material early enough.
 - 4. Manufacturer/fabricator refuses to certify or guarantee performance of specified product as required.
 - 5. Within fifteen (15) days of Award of Contract, the Contractor and Subcontractors under this Division shall submit to the Architect a complete list of manufacturers and model numbers proposed for the work of Division 15. Refer to the Paragraphs of this Section regarding: Approvals; Shop Drawings, Product Data and Samples; and Substitutions. The intent by the Contractor or Subcontractors to use the exact manufacturers and/or model numbers specified does not void the requirement for this Submission for Approval.

- B. The particular condition necessitating a substitution must be clearly indicated on the substitution's transmittal or it will be returned unreviewed.
- C. The Contractor shall submit a substitution for review before releasing an order for fabrication and/or shipment. The Architect reserves the right to reject such substitution, provided the item offered, in his opinion, is not equal to the item specified.
- D. When a Contractor proposes to use an item of equipment other than that specified or detailed on the Drawings, and which requires any redesign of structure, partitions, foundations, piping, wiring, or of any other part of the mechanical, electrical, or architectural layout, the Contractor shall assume responsibility for additional costs incurred in planning, design and construction to accommodate the substitution. If approved by the Architect, redesigned drawings and details to accommodate the substitution may be prepared by the Contractor at his own expense.
- E. If a substitution requires a different quantity and arrangement of piping, wiring, conduit, and equipment from that specified or indicated on the Drawings, subject to approval of the Architect, the Contractor shall provide any such piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

1.11 CODE REQUIREMENTS, PERMITS AND FEES:

- A. Perform work in accordance with applicable provisions of the accepted version of the BOCA National Plumbing Code, BOCA National Mechanical Code, NFPA codes including the National Electric Code and Life Safety Code, ASHRAE Handbooks/Standards, SMACNA Technical Manuals/Standards, American National Standards Institute, Inc. (ANSI) Standards including A117.1, applicable edition, and all state and local codes. All work shall also be in compliance with utility companies' requirements.
- B. In cases of differences between building codes, state laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Promptly notify Architect in writing of such differences.
- C. Include in the work, without extra cost to the Owner, any labor, material, service, test, apparatus, or drawing (in addition to Contract Drawings and Documents) in order to comply with applicable laws, ordinances, rules, regulations, and local authority's requirements, whether or not shown on Drawings and/or specified.
- D. Give all necessary notices, obtain all permits before commencing work, and pay all governmental taxes, fees and other costs in connection with the work. File all necessary plans, prepare all documents, and obtain all necessary approvals of the authorities having jurisdiction. Obtain all required Certificates of Inspection for the work, and deliver them to the Owner before requesting final payment for the work.
- E. The Contractor shall ensure that all system components, methods of installation, and materials complies with ASTM, OSHA, and Owners' standards for off-gassing.

- F. The Contractor shall be licensed in accordance with the guidelines of the Department of Consumer Protection. The workers employed by the Contractor shall be skilled and licensed to perform the work involved.

1.12 ROYALTIES AND PATENTS:

- A. The Contractor shall pay all royalties and shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof.
- B. If the Contractor observes that a process or article specified is an infringement of a patent, the Contractor shall promptly notify the Architect in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work. If the Contractor performs any work specified, knowing it to be an infringement of a patent, the Contractor shall bear all costs arising there from.

1.13 RECORD DRAWINGS:

- A. Clearly record differences between mechanical and electrical work as installed and as shown or called for in the Contract Documents. Accurate notations of all locations, sizes and inverts of all concealed materials shall be made. These records shall be marked, concurrent with progress, on a set of prints labeled "RECORD DRAWINGS."
- B. On completion of project, mark a set of prints with data transferred from the Record Drawings, and submit them to the Architect for review for legibility and clearness of presentation of the recorded conditions of construction.

1.14 INSTRUCTION OF OWNER'S PERSONNEL:

- A. After completion of all work and all tests and at such time as designated by the Owner's representative, the Contractor shall provide the necessary skilled personnel to operate each entire installation for a period of two (2) days of eight hours each day.
- B. During the operating period, the Contractor shall fully instruct the Owner's representative in the complete operation, adjustment, and maintenance of the entire installation.

1.15 OPERATION AND MAINTENANCE MANUALS:

- A. Prepare a manual of operation and maintenance instructions, in draft form, and submit to the Architect for review.
- B. The Manual shall contain the following items:
 - 1. Brief description of each system covering its basic operating characteristics.
 - 2. List of all equipment with manufacturer's name and model number for each item.

3. Contractor's own written operating and maintenance instructions, including detailed step-by-step instruction for starting, summer operation, winter operation, and shutdown of each system.
 4. Copies of submittals having final review stamps.
 5. Manufacturer's bulletins, data, parts lists, operating and maintenance instructions, guarantees and any other information pertinent to the proper operation of each system and item of equipment installed.
 6. Copy of each automatic control diagram with respective sequence of operation.
 7. Copy of each valve chart.
 8. Information of actions to be taken in the event of a malfunction or other emergency.
 9. Time schedule for recommended maintenance operation.
- C. At least two weeks prior to the scheduled instruction of Owner's representatives, provide the Architect with five (5) complete copies of the final form of the Operation and Maintenance Manual, bound in booklet form in durable binders, suitable indexed with labelled tabs for each item.

1.16 WARRANTY:

- A. The Contractor shall warrant that all work installed will be free from any and all defects, and that all apparatus will develop capacities and characteristics specified, and that if, during a period of one (1) year from date of completion and acceptance of the work, any such defects in workmanship, materials, or performance appear, the Contractor shall immediately replace, repair or otherwise correct the defect or deficiency without cost and within a reasonable time to be specified in writing to the Owner.
- B. The Contractor shall also replace or repair, to the satisfaction of the Owner and Architect, all damage done to any material or finish in consequence of work performed in fulfilling the warranty.
- C. In the case of default on this warranty by the Contractor, the Owner may have such work done as required, and charge the cost to the Contractor.

1.17 VISITING THE SITE:

- A. Before submitting a final proposal, the Contractor shall examine the site of the proposed work to determine the existing conditions that affect the work. The Contractor will be held responsible for any assumptions made by him in regard thereto. Time for this examination must have prior approval of the Owner.
- B. No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions. All existing systems shall remain in operation at all times except as otherwise arranged under shutdowns.

1.18 EXISTING SYSTEMS:

- A. Prior to bid, the Contractor shall make a detailed examination of the existing building(s) including all existing services and systems to become thoroughly familiar with the scope of work and working conditions. Contractor shall pay particular attention to all existing services and interconnecting systems. All existing systems shall remain in operation at all times except as otherwise arranged under SHUTDOWNS.
- B. The Contractor shall include, in his proposal, for all necessary relocation or revamping of such services and systems, where necessitated by the renovation work, to provide a finished final project. All relocation or revamping shall be provided by the Contractor without additional cost to the Owner, and shall be arranged, as directed by the Owner in the field, to be encased in a finished manner within the building. Any equipment or material to remain or be reused that may be damaged during construction shall be replaced by the Contractor at no additional cost to the Owner. Any existing equipment or material to be removed shall be disposed of by the Contractor or stored by the Contractor, as directed by the Owner.

1.19 SHUTDOWNS:

- A. When installation of a new system, or modification of an existing system, requires the temporary shutdown of an existing operation, the connections of the new system, or modified system, shall be performed at such time as designated by the Owner, in writing. Shutdowns shall be staged for minimum downtime.
- B. The Owner shall be notified of the estimated duration of the shutdown period at least five (5) days in advance of the date the work is to be performed.
- C. Work shall be arranged for continuous performance, including overtime if required, to assure that existing operating services will be shut down only during the time actually required to make necessary connections.
- D. Where any disruption of systems or services serving life safety or critical functions are necessary, the Contractor shall provide and pay for outside additional services, equipment and operations as may be required by the Authority Having Jurisdiction, to provide constant, around-the-clock protection throughout the entire affected areas.
- E. Where required by the Authority Having Jurisdiction, provide the services, personnel, vehicles, equipment and operations as may be required including, but not limited to: local fire department personnel, vehicles and equipment for an approved "fire watch"; on-site local fire department equipment, tankers, pumpers, trucks and aerial vehicles; local police department personnel, vehicles and equipment; ambulance personnel, vehicles and equipment; and utility company's personnel, vehicles and equipment, etc., as may be required or necessary.

1.20 EXISTING FACILITY:

- A. All work within the existing facility shall be done at a time prearranged with occupants so as to minimize disturbing the facility's operation.

- B. As the buildings will not remain occupied during the course of construction, extreme care shall be exercised by the Contractor to protect the occupants and their furnishings and belongings from damage due to the renovation and modernization work being performed.

1.21 FINAL ACCEPTANCE:

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following list:
 1. Submit the final payment request to the Architect with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 2. Submit an updated final statement to the Architect, accounting for final additional changes to the Contract Sum.
 3. Submit a certified copy of the Architect's Final Inspection list of items to be completed or corrected, stating that each item has been completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
 4. Submit consent of surety to final payment.
 5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Reinspection Procedure: The Architect will reinspect the Work upon receipt of notice from the Contractor that the Work, including Final Inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.
 1. Upon Completion of reinspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, reinspection will be repeated, and the Contractor will bear the cost.

PART 2 – PRODUCTS

2.1 MANUFACTURER'S IDENTIFICATION:

- A. Manufacturer's nameplate, name, or trademark shall be permanently affixed to all equipment and material furnished under this Specification. The nameplate of a subcontractor or distributor will not be acceptable.

2.2 NAMEPLATES:

- A. Provide for each item of equipment, including controls, a permanently attached nameplate made of laminated bakelite with incised letters; nameplate shall have black surface and white core.
- B. Nameplates shall be a minimum of 3" long by 1-1/2" wide and shall bear the equipment name and item as designated in the equipment schedule.

2.3 ACCESS DOORS:

- A. Furnish access doors to provide access to valves, cleanouts, dampers, controls, junction boxes, etc. concealed behind finished construction. Doors shall have a fire-resistance rating classification to match the construction which they are installed in. Doors shall be of the flush type with slot head-operated cam lock, 16-gage anchor frame, and hinged panel, as manufactured by Goal Inc., Karp Associates Inc., Elmdor Mfg. Co., or Milcor. Minimum size shall be 12" x 12". Doors shall be furnished by each Section of Division 15 for installation by other Divisions.

2.4 TAGS AND CHARTS:

- A. The Contractor shall furnish and attach to each valve a 1-1/2" diameter brass tag with 1/2" indented numerals filled with durable black compound. Tags shall be securely attached to stems of valves with copper wire and "S" hooks.
- B. Valves charts shall list each valve and describe its function. Upon completion of the work, one (1) copy of each chart, sealed to rigid backboard with clean lacquer, placed under glass and framed, shall be hung in a conspicuous location in the main equipment room, unless otherwise directed by the Architect. Two (2) additional unmounted copies shall be delivered to the Architect.
- C. Provide tags for the following valves:
 - 1. Zone control, bypass, shut-off and balancing valves.
 - 2. Control, bypass, shut-off, balancing and drain valves for major pieces of equipment.
 - 3. Building and area shut-off and balancing valves.
 - 4. System drain valves.

2.5 ELECTRICAL MOTORS:

- A. All electric motors shall conform to requirements of IEEE, NEMA, UL, NEC, and shall be suitable for required load, duty, voltage, phase, frequency, service and location.
- B. All motors shall be suitable for continuous duty at rated horsepower with temperature rise not to exceed 40°C for drip-proof motors, 50°C for splash-proof motors, and shall be capable of withstanding momentary overloads of 25% without injurious overheating.

- C. Motors 1/2 horsepower and larger shall have ball or roller bearings with pressure grease lubrication, except where otherwise noted.
- D. Direct connected motors shall be furnished without an adjustable base. All motors connected to driven equipment by belt or chain shall be furnished with adjustable sliding bases, except fractional motors with slotted mounting holes.
- E. All motor leads shall be permanently identified and supplied with connectors.
- F. Motors shall have nameplates giving manufacturer's name, serial number, horsepower, speed and current characteristics.
- G. Motors smaller than 1/2 horsepower shall be capacitor-start or split-phase type designed for 120 volts, single phase, 60 cycles alternating current. Motors 1/2 horsepower and larger shall be squirrel cage induction or wound motor, induction type for 3 phase, 60 cycles, alternating current as noted on the plans.
- H. Motors 1 horsepower and greater shall be 1800 RPM, polyphase, open drip-proof or totally enclosed fan-cooled.

2.6 SLEEVES, INSERTS AND ANCHOR BOLTS:

- A. Each Section of Division 15 shall be responsible for the location and proper position of sleeves and anchor bolts. If failure to do so requires cutting and patching of finished work, it shall be done at no extra cost to the Owner.
- B. Piping or conduits passing through concrete, masonry, and fire rated or smoke rated floors/walls/ceilings/partitions shall be provided with sleeves having an internal diameter 1/2" larger than the outside of the conduit. Seal for acoustical purposes and to maintain fire and smoke ratings.
- C. Sleeves through concrete floors or interior masonry walls shall be Schedule 40 black steel pipe, set flush with wall, floor or ceiling surface. Sleeves through floors shall be sealed with a fireproof, resilient material to maintain the fire rating integrity of the assembly.
- D. Sleeves through floors of wet areas such as equipment rooms, toilet rooms, etc., shall extend 2" above finished floor surface and be sealed as noted above. In addition, caulk with waterproof compound to the approval of the Architect.

2.7 FIRESTOPPING:

- A. Requirements: Conduits, cables, busways plumbing and mechanical piping, HVAC or mechanical ducting that penetrate fire rated walls or floors shall be sealed by means of a UL listed system. Refer to the UL Fire Resistance Directory, Vol.II, 1996 edition. Other equivalent third party testing agencies, such as Factory Mutual Systems Approval, are acceptable. Piping penetrating framed walls shall meet UL No. 187, and piping penetrating concrete floors or block walls shall meet UL No. 281.

- B. Submittals: Submit manufacturer's literature, specifications, installation instructions and material safety data sheets for the product(s) intended for use. Include with the submittal a list of all walls and floors that are to be penetrated, cross referenced to the UL system to be used. Where designated on the plans, use a system that is capable of retrofit without damage to the system. Failure of the Architect or Engineer to designate a required firestop does not relieve the Contractor of the responsibility to provide an approved system.
- C. Design: Unless otherwise specified, the "F" rating (burn thru time) of the system(s) shall be equal to or longer than the wall or floor being penetrated. Where penetrants pass thru finished walls and floors, the firestop materials when cured shall be compatible with the wall or floor finish. (For example, a firestop thru a painted block wall shall be sandable and paintable.) Where open (as opposed to closed piping) penetrants such as cable tray or busway are fire-stopped, the individual conductors shall be properly sealed by means of a cable sealant or factory installed, UL listed internal (in the case of busway) firestop or other approved method.
- D. Installation: All seals shall be installed in accordance with the manufacturer's design and instructions. Demonstrate to the Owner that the installer is capable of installing each system properly by submitting samples or by performing one or more installations in the presence of the Owner. Include with the Record Drawings a UL system number for each firestop.
- E. Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. Dow Corning Corporation
 - 2. 3M Fire Protection Products
 - 3. International Protective Coatings
 - 4. HILTI, Inc.

2.8 PLASTIC PIPE MARKERS:

- A. Provide manufacturer's standard pre-printed, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers, complying with ANSI A13.1.
- B. Markers shall be fastened to pipe (or insulation) by adhesive lap joint in pipe marker overlap, or by color-coded plastic adhesive tape, not less than 3/4" wide, full circle at both ends of pipe marker, tape lapped 1-1/2".
- C. Lettering: Manufacturer's standard preprinted nomenclature which best describes piping system in each case.
- D. Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. Seton Name Plate Company
 - 2. W.H. Brady Company

3. Allen Systems
4. Emed Co., Inc.
5. Marking Services, Inc.

2.9 LIMITED-COMBUSTIBLE MATERIAL:

- A. All materials installed in concealed spaces shall have a Btu content not exceeding 1000 Btu per square foot or shall be classed as limited-combustible having a potential heat value not exceeding 3500 Btu per lb.

2.10 MATERIALS AND EQUIPMENT:

- A. Prior to ordering or use of any material or equipment, it shall be the sole responsibility of the Contractor to ensure that the manufacturer certifies in writing that all material and equipment supplied is suitable and approved by code, and in accordance with the manufacturer's recommendations and installation instructions for use in the particular manner and location intended. Contractor shall make due allowance for this in the bid and shall include any accessories or revisions required at no additional charge.
- B. New materials and equipment installed into existing work shall be compatible with the existing work. The Contractor shall advise the Architect before ordering and/or installing any materials or equipment if he disputes those items and/or methods specified. Otherwise, the Contractor shall take full responsibility for their performance and suitability. Only new materials and/or equipment shall be used.

PART 3 - EXECUTION

3.1 PROTECTION OF WORK AND PROPERTY:

- A. The Contractor shall be responsible for the maintenance and protection of all equipment, materials and tools supplied by the Contractor and stored or installed on the job site, from loss or damage of all causes, until final acceptance by the Owner.
- B. The Contractor shall be responsible for the protection of any finished work of other trades from damage or defacement by the Contractor's operation and must remedy any such injury at the Contractor's own expense.

3.2 SCAFFOLDING, RIGGING, AND HOISTING:

- A. The Contractor shall provide all scaffolding, rigging, hoisting and services necessary for erection and delivery into the premises for all equipment and materials furnished, and remove same from premises when no longer required.

3.3 CUTTING, PATCHING, EXCAVATION AND BACKFILL:

- A. All cutting, patching, excavation and backfill shall be provided by other Divisions. Coordinate all requirements well in advance.

3.4 ACCESSIBILITY:

- A. The Contractor shall install all items so that parts requiring inspection, maintenance and repair are readily accessible. Minor deviations from the Drawings may be made to accomplish this, but changes of magnitude shall not be made without prior written approval of the Engineer.

3.5 PIPE EXPANSION:

- A. All pipe connections shall be installed to allow for freedom of movement of the pipe during expansion and contraction without springing. Swing joints, expansion loops and expansion joints with proper anchors and guides shall be provided by the Contractor where necessary, and/or where shown on the Drawings. Anchors and guides shall be subject to the approval of the Architect.
- B. The Contractor shall provide all bases and supports not part of the building structure, of required size, type, and strength, as approved by the Architect, for all equipment and materials furnished by the Contractor.
- C. All equipment, bases and supports shall be adequately anchored to the building structure to prevent shifting of position under operating conditions.

3.6 SEISMIC REQUIREMENTS:

- A. All new mechanical and electrical machinery, equipment, piping, ductwork, wiring and conduit shall be installed to resist vertical and lateral forces in accordance with the State Building Code and applicable regional seismic codes, with the exception of the following:
 - 1. Piping (excluding natural or propane gas piping) in boiler and mechanical rooms less than 1-1/4" inside diameter.
 - 2. All other piping (excluding natural or propane gas piping) less than 2-1/2" inside diameter.
 - 3. All electrical conduit less than 2-1/2" inside diameter.
 - 4. All rectangular air-handling ducts less than 6 square feet in cross-sectional area.
 - 5. All round air-handling ducts less than 28" in diameter.
 - 6. All piping suspended by individual hangers 12" or less in length from the top of the pipe to the bottom of the support for the hanger.
 - 7. All ducts suspended by hangers 12" or less in length from the top of the duct to the bottom of the support for the hanger.
- B. New ductwork and piping shall be provided with seismic restraints in accordance with Seismic Hazard Level (SHL) B of the latest edition of SMACNA "Seismic Restraint Manual Guidelines For Mechanical Systems" and in accordance with the State Building Code.

- C. Where seismic restraints are installed, the spring vibration isolators or other restraint assemblies shall be designed and installed in accordance with the manufacturer's specifications. The restraint assembly shall be designed to withstand the seismic lateral forces established in the State Building Code for a Zone 2 seismic area.
- D. Provide seismic snubbers, separate from or integral with spring isolators, for attachment to machinery and equipment bases, designed to provide seismic restraint in all modes (directions) in accordance with the State Building Code and applicable regional seismic codes. These snubbers shall have no contact with equipment during normal operation and shall have minimum clearances of 1/4" in all directions. Seismic snubbers shall be installed in strict accordance with the manufacturer's recommendations.
- E. Spring Isolators shall have the following characteristics.
1. Minimum outside diameter to overall height ratio of 0.8:1.0.
 2. Corrosion resistance where exposed to corrosive environment with:
 - a. Springs cadmium plated or electro-galvanized.
 - b. Hardware cadmium plated.
 - c. All other metal parts hot-dip or hot spray galvanized for outdoor applications.
 3. Reserve deflection (from published load ratings to solid height) of 50% of the rated deflection.
 4. Minimum 1/4" thick neoprene acoustical base pad or cup on underside.
 5. Designed and installed so that ends of springs remain parallel.
 6. Mason Industries Type SLF or similar type by other acceptable manufacturer.
- F. Anchorage of Equipment to Housekeeping Pads: Place floor mounted equipment on 4" high concrete housekeeping pads properly doweled or expansion shielded to the floor to meet acceleration criteria. Anchor isolators and/or bases to housekeeping pads. Concrete work shall be provided by other Divisions.
- G. Anchorage of Housekeeping Pads: All concrete housekeeping pads must be anchored to the structure to meet acceleration criteria. This Contractor shall coordinate this with other Divisions.
- H. Acceptable Manufacturers: Subject to compliance with requirements, provide seismic restraint and isolation products of one of the following manufacturers.
1. Mason Industries, Inc.
 2. Vibration Eliminator Co., Inc.

3. Vibration Mountings and Controls, Inc.

- I. Submit product data and details of all seismic restraints and isolators.

3.7 QUIET OPERATION:

- A. All equipment and material provided by the Contractor shall operate under all conditions of load without any sound or vibration which in the opinion of the Architect is objectionable. Where sound or vibration is objectionable in the opinion of the Engineer, the Contractor shall eliminate it in a manner approved by the Architect.

3.8 PAINTING:

- A. Other Divisions shall clean and paint all new exposed, unpainted, non-galvanized, metal surfaces of pipes, conduits, equipment, hangers, supports and accessories with one (1) prime coat and two (2) finish coats. Coordinate all requirements well in advance.
- B. Other Divisions shall also paint exposed surfaces of inertia bases and housekeeping pads.
- C. Paint colors shall be as follows. Confirm colors with Architect, including for items not listed.

- | | |
|----------------------------------|---------------|
| 1. Fuel Oil Piping | Safety Yellow |
| 2. Inertia Base/Housekeeping Pad | Medium Blue |
| 3. Equipment | Light Grey |

3.9 CLEANING OF PIPING AND EQUIPMENT:

- A. Clean exposed piping, ductwork, equipment and fixtures. Repair damaged finishes and leave everything in working order satisfactory to the Architect.
- B. Thoroughly clean all equipment inside and outside of all foreign substances before being placed into operation. If any part of a system should be stopped by any foreign matter after being placed in operation, the system shall be disconnected, cleaned and reconnected wherever necessary to locate and remove obstructions. Any work damaged in the course of removing obstructions shall be repaired or replaced when the system is reconnected, at no additional cost to the Owner.

3.10 PLASTIC PIPE MARKERS:

- A. Install pipe markers on each mechanical system, and include arrows to show normal direction of flow.
- B. Locate pipe markers and color bands as follows wherever piping is exposed to view, as well as above removable acoustical ceilings.
1. Near each valve and control device.

2. Near each branch, excluding short take-offs for fixtures and terminal units. Mark each pipe at branch where there could be question of flow pattern.
3. Near locations where pipes pass through walls or floors/ceilings, or enter non-accessible enclosures. Omit this on piping above removable acoustical ceilings.
4. At access doors, and similar access points which permit view of concealed piping.
5. Near major equipment items and other points of origination and termination.
6. Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.

3.11 TESTS:

- A. All equipment shall be tested as determined by all authorities having jurisdiction, but in no case less than that specified under each section of the Specifications. Labor, materials, instruments and power required for testing shall be furnished by the Contractor, unless otherwise indicated under the particular section of the Specifications.
- B. Tests shall be performed to the satisfaction of the Architect and such other parties as may have legal jurisdiction.
- C. All defective work shall be promptly repaired or replaced and the tests shall be repeated until the particular system and component parts thereof receive the approval of the Architect.
- D. Any damages resulting from tests shall be repaired and damaged materials replaced, all to the satisfaction of the Architect.
- E. Equipment and systems which normally operate during certain seasons of the year shall be tested during the appropriate season. Tests shall be performed on individual equipment, systems and their controls. Whenever the equipment of a system under test is interrelated with, and depends upon, the operation of other equipment, systems and controls for proper operation, functioning and performance, the latter shall be operated simultaneously with the equipment or system being tested.

3.12 SUSPECTED EXISTING MATERIALS:

- A. Should asbestos or suspected asbestos be encountered during the course of the work, immediately discontinue all work in that area and report the condition to the Owner for resolution.
- B. All such suspected asbestos shall be reviewed and removed as required by the Owner under a separate contract by other contractors engaged directly by the Owner.

- C. No work in the area shall proceed until suspected asbestos is reviewed, all work on such has been completed, and the Owner notifies the Contractor to proceed accordingly.

3.13 REMOVED EQUIPMENT:

- A. All existing material or equipment replaced or superseded by the Contractor's work shall be removed by the Contractor in an approved manner and the existing structure and surfaces shall be restored by the Contractor to match the finished product. All removed equipment shall remain the property of the Owner and shall be carefully stored at the job site or removed from the premises by the Contractor as directed by the Owner.

3.14 RELOCATED EQUIPMENT:

- A. All equipment, scheduled for relocation, shall be carefully removed by the Contractor and stored in a protected manner until relocated. Any damage done to relocated equipment during removal, storage or relocation shall be corrected by the Contractor in an approved manner, including repair or replacement, as directed by the Architect.

END OF SECTION 22 00 50

SECTION 22 00 60

BASIC PLUMBING REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, apply to work of this Section.

1.2 INCLUDED IN THIS SECTION:

- A. General Requirements for Mechanical Work
- B. Nameplates
- C. Access Doors
- D. Tags and Charts
- E. Sleeves, Inserts and Anchor Bolts
- F. Plastic Pipe Markers

1.3 DESCRIPTION OF WORK:

- A. This Section specifies general requirements for mechanical work. Definitions, intent, drawings, interpretation of documents, approvals, submittals, substitutions, code requirements, permits, fees, royalties, patents, record drawings, instruction of Owner's personnel, and warranty are described.
- B. Operation and maintenance manuals shall be submitted to the Architect prior to the scheduled instruction of Owner's representatives. These manuals shall contain equipment lists, manufacturer's literature, valve charts, and time schedule for recommended maintenance.
- C. Brass tags shall be securely attached to each valve. Valve charts shall list each valve and describe its function. One copy of each valve chart shall be placed under glass, framed, and hung in a conspicuous location in the boiler room.
- D. Plastic pipe markers shall be provided on exterior of piping for identification purposes. These markers shall be manufacturer's standard pre-printed, color-coded, pressure-sensitive vinyl type.

1.4 DEFINITIONS:

- A. "Provide" means to supply, erect, install, and connect up in complete readiness for regular operation, the particular work referred.
- B. "Furnish" means to supply and deliver to the job.

- C. "Install" means to erect, install and connect up in complete readiness for regular operation.
- D. "Conduit" includes, in addition to conduit, all fittings, sleeves, connections, hangers, and other accessories related to such conduit.
- E. "Wiring" means, in addition to wire, all needed connectors, circuit breakers, switches and devices, junction boxes and other items necessary for normal operation of the item being referred to.
- F. "Piping" includes, in addition to pipe, all fittings, valves, hangers, and other accessories related to such piping.
- G. "Concealed" means hidden from sight, as in chases, furred spaces, shafts, hung ceilings, or embedded in construction.
- H. "Exposed" means not concealed as defined above. Trenches, crawl spaces, and tunnels shall be considered exposed.
- I. "Governmental" means all municipal, state, and federal governmental agencies.
- J. "Owner" means the property owner, Ronald Terebisi, Jr., who shall take occupancy of the space after final acceptance.
- K. "Extend" means to supply, erect, install and connect up on complete readiness for regular operation the particular work referred.
- L. "Architect" shall mean Martinez Couch & Associates, LLC.

1.5 INTENT:

- A. It is the intention of the Drawings and Specifications to call for finished work, tested and ready for operation. All materials, equipment and apparatus shall be new and of first class quality.
- B. Any apparatus, appliance, material, or work not shown on the Drawings, but mentioned in the Specifications, or vice versa, or any incidental accessories, or minor details not shown, but necessary to make the work complete and perfect in all respects, and ready for operation, even if not particularly specified, shall be provided by the Contractor without additional expense to the Owner.
- C. With the submission of bid, the Contractor shall give written notice to the Architect of any materials, apparatus or omissions believed to be in violation of laws, ordinances, rules or regulations or authorities having jurisdiction. In the absence of such written notice it is mutually agreed that the Contractor shall include the cost of providing all systems in accordance with applicable regulations without extra compensation.

1.6 DRAWINGS:

- A. The Drawings are generally diagrammatic and are intended to convey the scope of work and indicate general arrangement of equipment, ducts, conduits, piping, fixtures and connections.

- B. Consider architectural and structural drawings part of this work insofar as these drawings furnish information relating to design and construction of the building.
- C. The Drawings do not indicate all offsets, fittings, and accessories which may be required. Investigate structural and finish conditions affecting this work, and arrange work accordingly, providing such fittings, valves, and accessories required to meet the conditions.
- D. The locations of all items shown on the Drawings or called for in the Specifications that are not definitely fixed by dimensions are approximate only. The exact locations necessary to secure the best conditions and results must be determined at the project, and shall have the approval of the Architect before being installed. DO NOT SCALE DRAWINGS.
- E. Follow Drawings as closely as actual building conditions will permit in laying out work. Check Drawings for other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions throughout. Where headroom or space conditions appear inadequate, the Architect shall be notified before proceeding with installation.
- F. If directed by the Architect, the Contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.

1.7 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS:

- A. Any questions or disagreements arising as to the true intent of this Specification or the Drawings, or the kind and quality of work required thereby, shall be decided by the Architect, whose interpretations thereof shall be final, conclusive and binding on all parties.
- B. In the case of disagreement between Drawings and Specifications, or within either document itself, the better quality, greater quantity or more costly work shall be included in the contract price, and the matter referred to the Architect's attention for decision and/or adjustment.

1.8 APPROVALS:

- A. The materials, workmanship, design and arrangement of all work installed under the Contract shall be subject to the approval of the Architect. If material or equipment is installed before it is approved, the Contractor shall be liable for removal and replacement, at no extra cost to the Owner, if, in the opinion of the Architect, the material or equipment does not meet the intent of the Drawings and Specifications.

1.9 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES:

- A. The Contractor shall submit five (5) copies of Shop Drawings, Product Data and/or Samples to the Architect for review prior to releasing an order for fabrication and/or shipment. These submittals shall be given for materials and equipment and as called for under each particular Section of the Specifications.
- B. Product Data submittals shall consist of complete catalog data clearly indicating all applicable items, in the following manner:

1. State sizes, capacities, brand names, motor HP, accessories, materials, gauges, dimensions, and other pertinent information.
 2. List on catalog covers page numbers of submitted items.
 3. Underline applicable data. Highlighting applicable data is not sufficient.
- C. Incomplete or unclear submittals will be returned unreviewed for correction and resubmission. Additional copies beyond five (5), or submittals of items other than what is called for under each particular Section, will be returned unreviewed.
- D. Submittals of equipment or materials other than those indicated on the Drawings or in the Specifications will be returned unreviewed, except for reasons as noted under SUBSTITUTIONS.

1.10 SUBSTITUTIONS:

- A. Substitutions of equipment or materials other than those shown on the Drawings or called for in the Specifications will be considered for review only under one or more of the following conditions.
1. Less than three (3) acceptable manufacturers are indicated on the Drawings or in the Specifications.
 2. Substitution is required for compliance with subsequent interpretations of code requirements or insurance regulations.
 3. Substitution is required due to unavailability of special products, through no fault of the Contractor. Excluded is lack of availability within a desired time frame due to Contractor's failure to order equipment or material early enough.
 4. Manufacturer/fabricator refuses to certify or guarantee performance of specified product as required.
 5. Within fifteen (15) days of Award of Contract, the Contractor and Subcontractors under this Division shall submit to the Architect a complete list of manufacturers and model numbers proposed for the work of Division 15. Refer to the Paragraphs of this Section regarding: Approvals; Shop Drawings, Product Data and Samples; and Substitutions. The intent by the Contractor or Subcontractors to use the exact manufacturers and/or model numbers specified does not void the requirement for this Submission for Approval.
- B. The particular condition necessitating a substitution must be clearly indicated on the substitution's transmittal or it will be returned unreviewed.
- C. The Contractor shall submit a substitution for review before releasing an order for fabrication and/or shipment. The Architect reserves the right to reject such substitution, provided the item offered, in his opinion, is not equal to the item specified.

- D. When a Contractor proposes to use an item of equipment other than that specified or detailed on the Drawings, and which requires any redesign of structure, partitions, foundations, piping, wiring, or of any other part of the mechanical, electrical, or architectural layout, the Contractor shall assume responsibility for additional costs incurred in planning, design and construction to accommodate the substitution. If approved by the Architect, redesigned drawings and details to accommodate the substitution may be prepared by the Contractor at his own expense.
- E. If a substitution requires a different quantity and arrangement of piping, wiring, conduit, and equipment from that specified or indicated on the Drawings, subject to approval of the Architect, the Contractor shall provide any such piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

1.11 CODE REQUIREMENTS, PERMITS AND FEES:

- A. Perform work in accordance with applicable provisions of the accepted version of the International Plumbing Code, International Mechanical Code, International Building Code, State Fire Code, NFPA codes including the National Electric Code and Life Safety Code, ASHRAE Handbooks/Standards, SMACNA Technical Manuals/Standards, American National Standards Institute, Inc. (ANSI) Standards, National Sanitation Foundation, applicable edition, and all state and local codes. All work shall also be in compliance with utility companies' requirements. Comply with all applicable lead-free state and federal requirements.
- B. In cases of differences between building codes, state laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Promptly notify Architect in writing of such differences.
- C. Include in the work, without extra cost to the Owner, any labor, material, service, test, apparatus, or drawing (in addition to Contract Drawings and Documents) in order to comply with applicable laws, ordinances, rules, regulations, and local authority's requirements, whether or not shown on Drawings and/or specified.
- D. Give all necessary notices, obtain all permits before commencing work, and pay all governmental taxes, fees and other costs in connection with the work. File all necessary plans, prepare all documents, and obtain all necessary approvals of the authorities having jurisdiction. Obtain all required Certificates of Inspection for the work, and deliver them to the Owner before requesting final payment for the work.
- E. The Contractor shall ensure that all system components, methods of installation, and materials comply with ASTM, OSHA, and Owners' standards for off-gassing.
- F. The Contractor shall be licensed in accordance with the guidelines of the Department of Consumer Protection. The workers employed by the Contractor shall be skilled and licensed to perform the work involved.

1.12 ROYALTIES AND PATENTS:

- A. The Contractor shall pay all royalties and shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof.
- B. If the Contractor observes that a process or article specified is an infringement of a patent, the Contractor shall promptly notify the Architect in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work. If the Contractor performs any work specified, knowing it to be an infringement of a patent, the Contractor shall bear all costs arising there from.

1.13 RECORD DRAWINGS:

- A. Clearly record differences between mechanical and electrical work as installed and as shown or called for in the Contract Documents. Accurate notations of all locations, sizes and inverts of all concealed materials shall be made. These records shall be marked, concurrent with progress, on a set of prints labeled "RECORD DRAWINGS."
- B. On completion of project, mark a set of prints with data transferred from the Record Drawings, and submit them to the Architect for review for legibility and clearness of presentation of the recorded conditions of construction.

1.14 INSTRUCTION OF OWNER'S PERSONNEL:

- A. After completion of all work and all tests and at such time as designated by the Owner's representative, the Contractor shall provide the necessary skilled personnel to operate each entire installation for a period of one (2) day of eight hours each day.
- B. During the operating period, the Contractor shall fully instruct the Owner's representative in the complete operation, adjustment, and maintenance of the entire installation.

1.15 OPERATION AND MAINTENANCE MANUALS:

- A. Prepare a manual of operation and maintenance instructions, in draft form, and submit to the Architect for review.
- B. The Manual shall contain the following items:
 - 1. Brief description of each system covering its basic operating characteristics.
 - 2. List of all equipment with manufacturer's name and model number for each item.
 - 3. Contractor's own written operating and maintenance instructions, including detailed step-by-step instruction for starting, summer operation, winter operation, and shutdown of each system.
 - 4. Copies of submittals having final review stamps.

5. Manufacturer's bulletins, data, parts lists, operating and maintenance instructions, guarantees and any other information pertinent to the proper operation of each system and item of equipment installed.
 6. Copy of each automatic control diagram with respective sequence of operation.
 7. Copy of each valve chart.
 8. Information of actions to be taken in the event of a malfunction or other emergency.
 9. Time schedule for recommended maintenance operation.
- C. At least two weeks prior to the scheduled instruction of Owner's representatives, provide the Architect with five (5) complete copies of the final form of the Operation and Maintenance Manual, bound in booklet form in durable binders, suitable indexed with labelled tabs for each item.

1.16 WARRANTY:

- A. The Contractor shall warrant that all work installed will be free from any and all defects, and that all apparatus will develop capacities and characteristics specified, and that if, during a period of one (1) year from date of completion and acceptance of the work, any such defects in workmanship, materials, or performance appear, the Contractor shall immediately replace, repair or otherwise correct the defect or deficiency without cost and within a reasonable time to be specified in writing to the Owner.
- B. The Contractor shall also replace or repair, to the satisfaction of the Owner and Architect, all damage done to any material or finish in consequence of work performed in fulfilling the warranty.
- C. In the case of default on this warranty by the Contractor, the Owner may have such work done as required, and charge the cost to the Contractor.

1.17 VISITING THE SITE:

- A. Before submitting a final proposal, the Contractor shall examine the site of the proposed work to determine the existing conditions that affect the work. The Contractor will be held responsible for any assumptions made by him in regard thereto. Time for this examination must have prior approval of the Owner.
- B. No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions. All existing systems shall remain in operation at all times except as otherwise arranged under shutdowns.

1.18 EXISTING SYSTEMS:

- A. Prior to bid, the Contractor shall make a detailed examination of the existing building(s) including all existing services and systems to become thoroughly familiar with the scope of work and working conditions. Contractor shall pay particular attention to all existing services and interconnecting systems. All existing systems shall remain in operation at all times except as otherwise arranged under SHUTDOWNS.
- B. The Contractor shall include, in his proposal, for all necessary relocation or revamping of such services and systems, where necessitated by the renovation work, to provide a finished final project. All relocation or revamping shall be provided by the Contractor without additional cost to the Owner, and shall be arranged, as directed by the Owner in the field, to be encased in a finished manner within the building. Any equipment or material to remain or be reused that may be damaged during construction shall be replaced by the Contractor at no additional cost to the Owner. Any existing equipment or material to be removed shall be disposed of by the Contractor or stored by the Contractor, as directed by the Owner.

1.19 SHUTDOWNS:

- A. When installation of a new system, or modification of an existing system, requires the temporary shutdown of an existing operation, the connections of the new system, or modified system, shall be performed at such time as designated by the Owner, in writing. Shutdowns shall be staged for minimum downtime.
- B. The Owner shall be notified of the estimated duration of the shutdown period at least five (5) days in advance of the date the work is to be performed.
- C. Work shall be arranged for continuous performance, including overtime if required, to assure that existing operating services will be shut down only during the time actually required to make necessary connections.
- D. While the home is scheduled to be unoccupied during construction, where any disruption of systems or services serving life safety or critical functions are necessary, the Contractor shall provide and pay for outside additional services, equipment and operations as may be required by the Authority Having Jurisdiction, to provide constant, around-the-clock protection throughout the entire affected areas.
- E. Where required by the Authority Having Jurisdiction, provide the services, personnel, vehicles, equipment and operations as may be required including, but not limited to: local fire department personnel, vehicles and equipment for an approved "fire watch"; on-site local fire department equipment, tankers, pumpers, trucks and aerial vehicles; local police department personnel, vehicles and equipment; ambulance personnel, vehicles and equipment; and utility company's personnel, vehicles and equipment, etc., as may be required or necessary.

1.20 EXISTING FACILITY:

- A. All work within the existing facility shall be done at a time prearranged with Owner so as to minimize disturbances.

- B. As the home will remain unoccupied during the course of construction, extreme care shall be exercised by the Contractor to protect the occupants and their furnishings and belongings from damage due to the renovation and modernization work being performed.

1.21 FINAL ACCEPTANCE:

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following list:
1. Submit the final payment request to the Architect with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 2. Submit an updated final statement to the Architect, accounting for final additional changes to the Contract Sum.
 3. Submit a certified copy of the Architect's Final Inspection list of items to be completed or corrected, stating that each item has been completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
 4. Submit consent of surety to final payment.
 5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Reinspection Procedure: The Architect will reinspect the Work upon receipt of notice from the Contractor that the Work, including Final Inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.
1. Upon Completion of reinspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, reinspection will be repeated, and the Contractor will bear the cost.

PART 2 – PRODUCTS

2.1 MANUFACTURER'S IDENTIFICATION:

- A. Manufacturer's nameplate, name, or trademark shall be permanently affixed to all equipment and material furnished under this Specification. The nameplate of a subcontractor or distributor will not be acceptable.

2.2 ACCESS DOORS:

- A. Furnish access doors to provide access to valves, cleanouts, dampers, controls, junction boxes, etc. concealed behind finished construction. Doors shall have a fire-resistance rating classification to match the construction which they are installed in. Doors shall be of the flush type with slot head-operated cam lock, 16-gage anchor frame, and hinged panel, as manufactured by Goal Inc., Karp Associates Inc., Elmdor Mfg. Co., or Milcor. Minimum size shall be 12" x 12". Doors shall be furnished by each Section of Division 15 for installation by other Divisions.

2.3 TAGS AND CHARTS:

- A. The Contractor shall furnish and attach to each valve a 1-1/2" diameter brass tag with 1/2" indented numerals filled with durable black compound. Tags shall be securely attached to stems of valves with copper wire and "S" hooks.
- B. Valves charts shall list each valve and describe its function. Upon completion of the work, one (1) copy of each chart, sealed to rigid backboard with clean lacquer, placed under glass and framed, shall be hung in a conspicuous location in the boiler room, unless otherwise directed by the Architect. Two (2) additional unmounted copies shall be delivered to the Architect.
- C. Provide tags for the following valves:
 - 1. Zone control, bypass, shut-off and balancing valves.
 - 2. Control, bypass, shut-off, balancing and drain valves for major pieces of equipment.
 - 3. Building and area shut-off and balancing valves.
 - 4. System drain valves.

2.4 ELECTRICAL MOTORS:

- A. All electric motors shall conform to requirements of IEEE, NEMA, UL, NEC, and shall be suitable for required load, duty, voltage, phase, frequency, service and location.
- B. All motors shall be suitable for continuous duty at rated horsepower with temperature rise not to exceed 40°C for drip-proof motors, 50°C for splash-proof motors, and shall be capable of withstanding momentary overloads of 25% without injurious overheating.
- C. Motors 1/2 horsepower and larger shall have ball or roller bearings with pressure grease lubrication, except where otherwise noted.
- D. Direct connected motors shall be furnished without an adjustable base. All motors connected to driven equipment by belt or chain shall be furnished with adjustable sliding bases, except fractional motors with slotted mounting holes.
- E. All motor leads shall be permanently identified and supplied with connectors.
- F. Motors shall have nameplates giving manufacturer's name, serial number, horsepower, speed and current characteristics.

- G. Motors smaller than 1/2 horsepower shall be capacitor-start or split-phase type designed for 120 volts, single phase, 60 cycles alternating current. Motors 1/2 horsepower and larger shall be squirrel cage induction or wound motor, induction type for 3 phase, 60 cycles, alternating current as noted on the plans.
- H. Motors 1 horsepower and greater shall be 1800 RPM, polyphase, open drip-proof or totally enclosed fan-cooled, and shall be high efficiency type in accordance with the following chart:

Nominal HP	Minimum Nominal Motor Efficiency
1	84.0
1.5	84.0
2	84.0
3	87.5
5	88.5

2.5 ELECTRIC MOTOR STARTERS:

- A. All electric motor starters shall conform to requirements of IEEE, NEMA, UL, NEC, and shall be suitable for required load, duty, voltage, phase, frequency, service and location.
- B. When interlocking or automatic control of single-phase motors is required, motors shall be furnished with magnetic across-the-line starters.
- C. Three-phase motors shall be furnished with full voltage, magnetic across-the-line starters.
- D. All magnetic starters shall have start-stop pushbuttons in cover, except when interlocking or automatic control is required. Then starters shall have Hand-Off-Automatic selector switches with pilot lights in cover.
- E. All magnetic starters shall include overload and low voltage protection, one (1) set of auxiliary make-and break contacts, and green pilot lights for running condition.
- F. All magnetic starters shall have 120 volt, single phase, 60 cycle control circuit regardless of line voltage and include 0.5 KW transformer to provide 120 volt circuit where required.
- G. All magnetic starters shall have overload relays, one for each phase, of the melting alloy type. These thermal units shall be of one-piece construction and shall be interchangeable. The starter shall be inoperative if any thermal unit is removed.
- H. Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following:
1. Cutler-Hammer
 2. General Electric Corporation

3. Square D

2.6 SLEEVES, INSERTS AND ANCHOR BOLTS:

- A. Each Section of Division 15 shall be responsible for the location and proper position of sleeves and anchor bolts. If failure to do so requires cutting and patching of finished work, it shall be done at no extra cost to the Owner.
- B. Piping or conduits passing through concrete, masonry, and fire rated or smoke rated floors/walls/ceilings/partitions shall be provided with sleeves having an internal diameter 1/2" larger than the outside of the conduit. Seal for acoustical purposes and to maintain fire and smoke ratings.
- C. Sleeves through concrete floors or interior masonry walls shall be Schedule 40 black steel pipe, set flush with wall, floor or ceiling surface. Sleeves through floors shall be sealed with a fireproof, resilient material to maintain the fire rating integrity of the assembly.
- D. Sleeves through floors of wet areas such as equipment rooms, toilet rooms, etc., shall extend 2" above finished floor surface and be sealed as noted above. In addition, caulk with waterproof compound to the approval of the Architect.

2.7 FIRESTOPPING:

- A. Requirements: Conduits, cables, busways plumbing and mechanical piping, HVAC or mechanical ducting that penetrate fire rated walls or floors shall be sealed by means of a UL listed system. Refer to the UL Fire Resistance Directory, Vol.II, 1996 edition. Other equivalent third party testing agencies, such as Factory Mutual Systems Approval, are acceptable. Piping penetrating framed walls shall meet UL No. 187, and piping penetrating concrete floors or block walls shall meet UL No. 281.
- B. Failure of the Architect or Engineer to designate a required firestop does not relieve the Contractor of the responsibility to provide an approved system.
- C. Design: Unless otherwise specified, the "F" rating (burn thru time) of the system(s) shall be equal to or longer than the wall or floor being penetrated. Where penetrants pass thru finished walls and floors, the firestop materials when cured shall be compatible with the wall or floor finish. (For example, a firestop thru a painted block wall shall be sandable and paintable.) Where open (as opposed to closed piping) penetrants such as cable tray or busway are fire-stopped, the individual conductors shall be properly sealed by means of a cable sealant or factory installed, UL listed internal (in the case of busway) firestop or other approved method.
- D. Installation: All seals shall be installed in accordance with the manufacturer's design and instructions. Demonstrate to the Owner that the installer is capable of installing each system properly by submitting samples or by performing one or more installations in the presence of the Owner. Include with the Record Drawings a UL system number for each firestop.
- E. Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following:

1. Dow Corning Corporation
2. 3M Fire Protection Products
3. International Protective Coatings
4. HILTI, Inc.

2.8 PLASTIC PIPE MARKERS:

- A. Provide manufacturer's standard pre-printed, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers, complying with ANSI A13.1.
- B. Markers shall be fastened to pipe (or insulation) by adhesive lap joint in pipe marker overlap, or by color-coded plastic adhesive tape, not less than 3/4" wide, full circle at both ends of pipe marker, tape lapped 1-1/2".
- C. Lettering: Manufacturer's standard preprinted nomenclature which best describes piping system in each case.
- D. Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 1. Seton Name Plate Company
 2. W.H. Brady Company
 3. Allen Systems
 4. Emed Co., Inc.
 5. Marking Services, Inc.

2.9 LIMITED-COMBUSTIBLE MATERIAL:

- A. All materials installed in concealed spaces shall have a Btu content not exceeding 1000 Btu per square foot or shall be classed as limited-combustible having a potential heat value not exceeding 3500 Btu per lb.

2.10 MATERIALS AND EQUIPMENT:

- A. Prior to ordering or use of any material or equipment, it shall be the sole responsibility of the Contractor to ensure that the manufacturer certifies in writing that all material and equipment supplied is suitable and approved by code, and in accordance with the manufacturer's recommendations and installation instructions for use in the particular manner and location intended. Contractor shall make due allowance for this in the bid and shall include any accessories or revisions required at no additional charge.

- B. New materials and equipment installed into existing work shall be compatible with the existing work. The Contractor shall advise the Architect before ordering and/or installing any materials or equipment if he disputes those items and/or methods specified. Otherwise, the Contractor shall take full responsibility for their performance and suitability. Only new materials and/or equipment shall be used.

PART 3 - EXECUTION

3.1 PROTECTION OF WORK AND PROPERTY:

- A. The Contractor shall be responsible for the maintenance and protection of all equipment, materials and tools supplied by the Contractor and stored or installed on the job site, from loss or damage of all causes, until final acceptance by the Owner.
- B. The Contractor shall be responsible for the protection of any finished work of other trades from damage or defacement by the Contractor's operation and must remedy any such injury at the Contractor's own expense.

3.2 SCAFFOLDING, RIGGING, AND HOISTING:

- A. The Contractor shall provide all scaffolding, rigging, hoisting and services necessary for erection and delivery into the premises for all equipment and materials furnished, and remove same from premises when no longer required.

3.3 CUTTING, PATCHING, EXCAVATION AND BACKFILL:

- A. All cutting, patching, excavation and backfill shall be provided by other Divisions. Coordinate all requirements well in advance.

3.4 ACCESSIBILITY:

- A. The Contractor shall install all items so that parts requiring inspection, maintenance and repair are readily accessible. Minor deviations from the Drawings may be made to accomplish this, but changes of magnitude shall not be made without prior written approval of the Engineer.

3.5 PIPE EXPANSION:

- A. All pipe connections shall be installed to allow for freedom of movement of the pipe during expansion and contraction without springing. Swing joints, expansion loops and expansion joints with proper anchors and guides shall be provided by the Contractor where necessary, and/or where shown on the Drawings. Anchors and guides shall be subject to the approval of the Architect.
- B. The Contractor shall provide all bases and supports not part of the building structure, of required size, type, and strength, as approved by the Architect, for all equipment and materials furnished by the Contractor.
- C. All equipment, bases and supports shall be adequately anchored to the building structure to prevent shifting of position under operating conditions.

3.6 SEISMIC REQUIREMENTS:

- A. All new mechanical and electrical machinery, equipment, piping, ductwork, wiring and conduit shall be installed to resist vertical and lateral forces in accordance with the State Building Code and applicable regional seismic codes, with the exception of the following:
 - 1. Piping in boiler and mechanical rooms less than 1-1/4" inside diameter.
 - 2. All other piping less than 2-1/2" inside diameter.
 - 3. All electrical conduit less than 2-1/2" inside diameter.
 - 4. All rectangular air-handling ducts less than 6 square feet in cross-sectional area.
 - 5. All round air-handling ducts less than 28" in diameter.
 - 6. All piping suspended by individual hangers 12" or less in length from the top of the pipe to the bottom of the support for the hanger.
 - 7. All ducts suspended by hangers 12" or less in length from the top of the duct to the bottom of the support for the hanger.
- B. New ductwork and piping shall be provided with seismic restraints in accordance with Seismic Hazard Level (SHL) B of the latest edition of SMACNA "Seismic Restraint Manual Guidelines For Mechanical Systems" and in accordance with the State Building Code.
- C. Where seismic restraints are installed, the spring vibration isolators or other restraint assemblies shall be designed and installed in accordance with the manufacturer's specifications. The restraint assembly shall be designed to withstand the seismic lateral forces established in the State Building Code for a Zone 2 seismic area.
- D. Provide seismic snubbers, separate from or integral with spring isolators, for attachment to machinery and equipment bases, designed to provide seismic restraint in all modes (directions) in accordance with the State Building Code and applicable regional seismic codes. These snubbers shall have no contact with equipment during normal operation and shall have minimum clearances of 1/4" in all directions. Seismic snubbers shall be installed in strict accordance with the manufacturer's recommendations.
- E. Spring Isolators shall have the following characteristics.
 - 1. Minimum outside diameter to overall height ratio of 0.8:1.0.
 - 2. Corrosion resistance where exposed to corrosive environment with:
 - a. Springs cadmium plated or electro-galvanized.
 - b. Hardware cadmium plated.

3.8 PAINTING:

- A. Other Divisions shall clean and paint all new exposed, unpainted, non-galvanized, metal surfaces of pipes, conduits, equipment, hangers, supports and accessories with one (1) prime coat and two (2) finish coats. Coordinate all requirements well in advance.
- B. Other Divisions shall also paint exposed surfaces of housekeeping pads.
- C. Paint colors shall be as follows. Confirm colors with Architect, including for items not listed.
 - 1. Sprinkler Piping Safety Red
 - 2. Drain or Relief Piping Medium Green
 - 3. Sanitary or Waste Piping Medium Green
 - 4. Housekeeping Pad Medium Blue
 - 5. Equipment Light Grey

3.9 CLEANING OF PIPING AND EQUIPMENT:

- A. Clean exposed piping, equipment and fixtures. Repair damaged finishes and leave everything in working order satisfactory to the Architect.
- B. Thoroughly clean all equipment inside and outside of all foreign substances before being placed into operation. If any part of a system should be stopped by any foreign matter after being placed in operation, the system shall be disconnected, cleaned and reconnected wherever necessary to locate and remove obstructions. Any work damaged in the course of removing obstructions shall be repaired or replaced when the system is reconnected, at no additional cost to the Owner.

3.10 PLASTIC PIPE MARKERS:

- A. Install pipe markers on each mechanical system, and include arrows to show normal direction of flow.
- B. Locate pipe markers and color bands as follows wherever piping is exposed to view, as well as above removable acoustical ceilings.
 - 1. Near each valve and control device.
 - 2. Near each branch, excluding short take-offs for fixtures and terminal units. Mark each pipe at branch where there could be question of flow pattern.
 - 3. Near locations where pipes pass through walls or floors/ceilings, or enter non-accessible enclosures. Omit this on piping above removable acoustical ceilings.

4. At access doors, and similar access points which permit view of concealed piping.
5. Near major equipment items and other points of origination and termination.
6. Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.

3.11 TESTS:

- A. All equipment shall be tested as determined by all authorities having jurisdiction, but in no case less than that specified under each section of the Specifications. Labor, materials, instruments and power required for testing shall be furnished by the Contractor, unless otherwise indicated under the particular section of the Specifications.
- B. Tests shall be performed to the satisfaction of the Architect and such other parties as may have legal jurisdiction.
- C. All defective work shall be promptly repaired or replaced and the tests shall be repeated until the particular system and component parts thereof receive the approval of the Architect.
- D. Any damages resulting from tests shall be repaired and damaged materials replaced, all to the satisfaction of the Architect.
- E. Equipment and systems which normally operate during certain seasons of the year shall be tested during the appropriate season. Tests shall be performed on individual equipment, systems and their controls. Whenever the equipment of a system under test is interrelated with, and depends upon, the operation of other equipment, systems and controls for proper operation, functioning and performance, the latter shall be operated simultaneously with the equipment or system being tested.

3.12 SUSPECTED EXISTING MATERIALS:

- A. Should hazardous substances, such as asbestos or suspected asbestos, lead, pcb's, etc. be encountered during the course of the work, immediately discontinue all work in that area and report the condition to the Owner for resolution.
- B. All such suspected hazardous materials shall be reviewed and removed as required by the Owner under a separate contract by other contractors engaged directly by the Owner.
- C. No work in the area shall proceed until suspected hazardous materials is reviewed, all work on such has been completed, and the Owner notifies the Contractor to proceed accordingly.

3.13 REMOVED EQUIPMENT:

- A. All existing material or equipment replaced or superseded by the Contractor's work shall be removed by the Contractor in an approved manner and the existing structure and surfaces shall be restored by the Contractor to match the finished product. All removed equipment shall remain the property of the Owner and shall be carefully stored at the job site or removed from the premises by the Contractor as directed by the Owner.

3.14 RELOCATED EQUIPMENT:

- A. All equipment, scheduled for relocation, shall be carefully removed by the Contractor and stored in a protected manner until relocated. Any damage done to relocated equipment during removal, storage or relocation shall be corrected by the Contractor in an approved manner, including repair or replacement, as directed by the Architect.

END OF SECTION 22 00 60

SECTION 22 10 60

PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, apply to work of this Section.
- B. The requirements specified in Section 22 00 60, "Basic Plumbing Requirements," apply to this Section.
- C. Codes and Standards (comply with applicable editions) shall include, but are not limited to:
 - 1. Comply with the Safe Drinking Water Act, the Reduction of Lead in Drinking Water Act and NSF 91 no-lead requirements for all applicable equipment, piping, fittings, valving, solder, materials.
 - 2. Comply with the State Building, Plumbing, Fire, Mechanical and Energy Codes.

1.2 SCOPE OF WORK:

- A. This Section includes the providing of all labor, materials, fixtures, equipment, accessories, services and tests necessary to complete and make ready for operation by the Owner all plumbing work as shown on the Drawings and described in these Specifications. It is the intent of these Documents to terminate with complete, operational plumbing systems within the building.
- B. Material finishes exposed to occupants, including materials above finish ceilings where plenums are used, shall meet all applicable UL requirements and shall have a flame spread rating not exceeding 25 and smoke developed rating not exceeding 50.
- C. The work shall include but not be limited to the following:
 - 1. A complete sanitary system including fixtures, drains, and vent connections. Terminate this piping at connections to existing in an approved manner.
 - 2. A complete system of cold water piping as shown on the plans or as required for fixture connections. Terminate this piping at the existing piping in the vicinity 5'-0" outside of building for continuation by Division 2.
 - 3. A complete system of domestic service hot water piping from the domestic water heating plant, including recirculating pumps and controls.
 - 4. A complete set of plumbing fixtures, fittings and trim.

5. Insulation of piping and equipment.
6. Roughing and connections to Owner's fixtures and equipment.
7. Nameplates.
8. Tags and charts.
9. Sleeves, inserts, anchor bolts.
10. Pipe expansion compensation.
11. Seismic requirements.
12. Plastic pipe markers.
13. Access doors.
14. Testing and instruction of Owner's representatives.

1.3 WORK BY OTHERS:

- A. The following paragraphs list the only items of labor and materials incident to or related to the installation of the plumbing work which will be provided by others at no cost to this Section.
- B. All paper holders, towel bars, grab bars, mirrors, medicine cabinets and other accessories will be provided by other Divisions.
- C. Installation of base flashing around all vent stacks and soil stacks will be by other Divisions.
- D. All chases and furred spaces will be furnished by other Divisions. Notify well in advance of all requirements.
- E. Finish painting of exposed work installed under this contract will be by other Divisions unless specifically noted otherwise.
- F. All electric wiring to equipment installed under this Section will be by the Division 16. Coordinate all requirements in advance.
- G. Demolition, cutting, patching, excavation and backfill outside and inside the building shall be by other Divisions.
- H. Access panels shall be furnished by this Section for installation by the other Divisions unless otherwise indicated.
- I. Temporary services and facilities shall be by other Divisions.

1.4 SHOP DRAWINGS:

- A. Submit five (5) copies of Product Data to the Architect in accordance with Section 15010, "Basic Mechanical Requirements."
- B. Submittals shall be given for the following materials and equipment.
 - 1. Backflow preventers, pressure reducing valves and mixing valves.
 - 2. Piping, valves, fittings, coupling assemblies and piping specialties
 - 3. Piping and fitting insulation and covering.
 - 4. Coordination and Fabrication Drawings

PART 2 - PRODUCTS

2.1 SANITARY, WASTE & VENTPIPING MATERIAL:

- A. Soil, waste and vent piping and stacks shall be of sizes indicated on Drawings, shall be run in no hub cast iron complying with the latest edition of ASTM A888 or the latest edition of the Cast Iron Soil Pipe Institute Standard 301. The piping shall be marked with the Collective Trademark of the Cast Iron Soil Pipe Institute, listed by NSF International and as indicated on Drawings. All offsets shall be made at an angle of not more than 45 degrees and all horizontal piping shall have a pitch of not less than 1/8" per foot. Branch soil, waste and vent connections shall be run to the soil stack, waste stack, house drain or vent stack as shown on plans. Where practical, two or more vent pipes shall be connected together and extended as one pipe through the roof. Vertical vent pipes may be connected to main vent riser above fixtures vented. Where an end-circuit vent pipe from any fixture, or line of fixtures, is to be connected to a vent line serving other fixtures, the vent line shall be extended above the highest flood rim before being connected to the other vent lines, so as to prevent the use of any vent line as a waste pipe.
- B. All changes in pipe size on soil, waste and drain lines shall be made with reducing fittings or recessed reducers. Y-fittings and 1/8 or 1/16 bends or combination Y and 1/8 bends shall be used where possible.
- C. Sanitary long-sweep bends and T's shall be used for connection to branch lines for fixtures. On vertical runs of pipe, long-turn fittings shall be used wherever conditions permits.
- D. All horizontal lines not assigned invert elevations shall run at 1/4" per foot pitch. Check carefully all existing elevations before proceeding so as to keep within areas shown on Architectural Drawings.
- E. Where vent piping is run concealed in partitions, use special care to insure that all lines are maintained in their proper locations in the partitions so that no bends, fittings or parts of the piping will be visible.

- F. Vent or soil stacks run adjacent to the exterior walls of the building shall be offset back so that their roof penetrations will be inconspicuous from the street.
- G. Stainless steel coupling assemblies used in conjunction with No-Hub cast iron soil, waste and vent shall be tightened to 60 inch-pounds torque on each nut or bolt head with a torque wrench specifically designed for the purpose. Each nut or bolt head shall be retorqued after not less than four (4) hours. The use of screwdrivers or other types of wrenches shall not be permitted for this purpose.
- H. For piping under slab, minimum size shall be 3" for sanitary, waste and storm piping, 2" for waste piping serving hand sinks or lavatories only, and 2" for vent piping.

2.2 WATER PIPING MATERIALS:

- A. Existing water piping below ground shall be continued without replacement.
- B. Water piping above grade shall be hard drawn copper tubing, Type L, in strict accordance with Federal Specification WE-T-799.
- C. All exposed water supply piping to fixtures, including piping within cabinets or vanities shall be chrome plated copper or polished chrome plated brass. Provide chromed escutcheons at piping penetrations of walls and cabinets.

2.3 PIPE JOINTS AND CONNECTIONS:

- A. Compression type gaskets, as manufactured by Husky Technologies, a Division of Anaheim Foundry Co., Clamp-All Manufacturing Corp., MG Coupling Co., or Tyler Pipe & Foundry Company conforming to ASTM Spec. C1540, are permitted in conjunction with cast iron soil piping below grade.
- B. Coupling assemblies for No-Hub cast iron soil pipe shall consist of a stainless steel corrugated shield and tightening device, conforming to CISPI Std. 310-95, and a neoprene sealing sleeve, conforming to ASTM Spec. C564, assembled at the factory as a complete unit.
- C. Heavy duty no-hub couplings shall be type 304 stainless steel or cast iron and provide a minimum shield thickness of 0.015" and width of 3" for pipe sizes through 4", 4" width for pipes 5" and larger.
- D. Copper tubing shall be soldered with 95-5 and noncorrosive flux. Thoroughly clean inside and outside surfaces with sandpaper or wire brush before assembly. Defective joints shall be dismantled, cleaned and resoldered.
- E. All joints between steel or iron and copper shall be made with approved isolating fittings equal to Epoxy, or Walter Vallett Company 'V' line insulating couplings.
- F. All joints in threaded pipe shall be made with approved components. The ends of each pipe shall be reamed free from burrs and kept free from scale and dirt. A thin coat of approved pipe compound shall be applied to male fittings.

2.4 CLEANOUTS:

- A. Finished Floor: J.R. Smith 4023-U-PB, cast iron body, round adjustable polished bronze top with vandal proof screws. Provide J.R. Smith suffix DX wide flange when cleanouts are located in framed upper levels.
- B. Carpeted Floor: J.R. Smith 4025-U-X-PB, cast iron body, round adjustable polished bronze top with vandal proof screws and carpet marker. Provide J.R. Smith suffix DX wide flange when cleanouts are located in framed upper levels.
- C. VCT or Linoleum Type Floors: J.R. Smith 4143-U-PB, cast iron body, round adjustable polished bronze top with vandal proof screws, recessed for vinyl composite tile, linoleum and similar sheet floors. Where required to support cleanouts to manufacturer recommendations in framed floors, provide J.R. Smith suffix -F flashing flange and flashing clamp suffix -C.
- D. Terrazzo Floor: J.R. Smith 4183-U-NB, cast iron body, round adjustable nickel bronze top with vandal proof screws, recessed for terrazzo and similar poured floors. Provide J.R. Smith suffix DX wide flange when cleanouts are located in framed upper levels.
- E. Unfinished Floors: J.R. Smith 4243-U, cast iron body, round adjustable scoriated cast iron top with vandal proof screw. Provide J.R. Smith suffix DX wide flange when cleanouts are located in framed upper levels.
- F. Wall: J.R. Smith 4553-U-PB, cast iron cleanout tee with No Hub outlet, vandal proof screws and polished bronze frame and cover. Provide factory fabricated extension to wall as required.

2.5 UNIONS:

- A. Where union connections are installed on pipe 2" in diameter and smaller, they shall be of brass composition 'B' in accordance with Federal Specification WW-U-516.
- B. In general, all piping shall be provided at intervals with unions to permit alterations and repairs.

2.6 VALVES:

- A. Ball valves, 2" and smaller, shall be Jenkins figure 32-A, or equal, having two piece bronze body (ASTM B584), integral body bolts, TFE seat, threaded ends and rated for 400 PSI-WOG. Ball valves shall be full port and suitable for the WOG duty indicated.
- B. Gate valves 2-1/2" and smaller shall be Fairbanks figure 0280 C-C or equal. 3" and larger shall be Fairbanks figure 0403 F.E. or equal.
- C. Stop and waste gate valves 2" and smaller, shall be Fairbanks figure 0284, bronze body, solid wedge, non-rising stem, solder ends, rated for 300 PSI non-shock.
- D. Check valves 2" and smaller, shall be Jenkins figure 4093, bronze, rated for 300 PSI-WOG, solder ends, bronze disc, horizontal swing.

- E. Pressure reducing valves, 2" and smaller, shall be Watts U5B, bronze body, union inlet with threaded tailpiece, integral stainless steel strainer, built in thermal expansion bypass check valve and rated for 300 PSI.
- F. Pressure reducing valves, 3" size, shall be Watts No. N223 with auxiliary regulator tappings piped to 3/4" Watts No. 223.
- G. Hose end drain valves, 1-1/2" and smaller, shall be Jenkins 112 or 113, bronze body, threaded inlet and hose outlet, rated for 300 PSI non-shock water.

2.7 HANGERS:

- A. Hangers for copper tubing shall be copper plated, equal to Tolco Fig. 81. All other hangers shall be adjustable clevis or trapeze hangers. Hanger rods shall have machine threads.
- B. Hangers shall include seismic restraint devices indicated elsewhere in these specifications.

2.8 INSULATION:

- A. Cover all piping scheduled below with Owens Corning Fiberglas 25 ASJ insulation with sealed vapor barrier jacket.

<u>SERVICE</u>	<u>PIPE SIZE</u>	<u>THICKNESS</u>
Cold Water	1-1/2" and smaller	1.0"
	2" and larger	1.5"
Hot Water	2" and smaller	1.0"
	2-1/2" and larger	1.5"

- B. Cover all fittings and valve bodies with Zeston premolded PVC insulated pipe fittings. Glass fiber blanket in the Zeston fitting shall be compressed to the thickness of the adjacent insulation. On cold water fittings, the Zeston jacket shall be vapor sealed and banded to the adjacent covering. On hot water fittings, the jacket shall be banded only. With prior approval from the Architect, the following option may be exercised on cold water fittings in constricted work areas: cover with fiberglass blanket insulation with vapor barrier jacket lapping adjacent pipe insulation.

2.9 BACKFLOW PREVENTORS:

- A. Backflow preventers, 1/2" size, shall be Watts No. 9D.
- B. Backflow preventors 3/4" size and larger, shall be Watts 909S-AG-QT-HW for hot water piping and Watts 909S-AG-QT for cold water piping, operating on reduced pressure principle with bronze strainer, ball valve shut-offs, air gap and stainless steel check modules.

- C. All backflow preventers shall be installed in the horizontal position and drain lines shall be individually piped full size indirectly down to floor drain, service sink, 6" above finished floor or as noted on the Drawings.
- D. Unless indicated otherwise, provide matching backflow preventers installed in parallel so as to permit inspection, testing and repair of either unit during normal working hours of the local water utility.

2.10 ACCEPTABLE MANUFACTURERS:

- A. Subject to compliance with requirements, provide equipment or material of one of the following manufacturers listed.
- B. Cleanouts, Fixture Supports:
 - 1. Jay R. Smith Mfg. Co.
 - 2. Wade Division/Tyler Pipe
 - 3. Zurn Industries, Inc., Hydromechanics Div.
 - 4. Josam
 - 5. Watts Drainage Products, USA
- C. Valves:
 - 1. Apollo
 - 2. Jenkins
 - 3. Fairbanks
 - 4. Milwaukee
 - 5. Nibco Inc.
 - 6. Watts Regulator Co.
 - 7. Hammond Valve Corp.
 - 8. Jomar International
- D. Backflow Preventers:
 - 1. Watts Regulator Co.
 - 2. Wilkins Division, Zurn Industries
 - 3. Conbraco Industries, Inc.

4. Lawler
 5. Ames
- E. Piping and Equipment Insulation:
1. Owens-Corning Fiberglas Corporation
 2. Manville
 3. Knauf Fiber Glass
 4. CertainTeed Corporation
- F. Thermostatic Mixing Valves:
1. Powers Process Controls
 2. Lawler
 3. Leonard Valve Company
 4. T & S Brass & Bronze Works Inc.
- G. No-Hub Cast Iron Pipe:
1. Charlotte Pipe and Foundry Company
 2. Tyler Pipe and Foundry
 3. AB&I Foundry
- H. No-Hub Coupling Assemblies:
1. Tyler Pipe & Foundry Company
 2. Husky Technologies, Anaheim Foundry Company
 3. Clamp-All Manufacturing Corp.
 4. MG Coupling Company

PART 3 - EXECUTION

3.1 SANITARY, WASTE & VENT PIPING INSTALLATION:

- A. Soil, waste and vent stacks of sizes indicated on Drawings shall be run as indicated on Drawings. All offsets shall be made at an angle of not more than 45 degrees and all horizontal piping shall have a pitch of 1/4" per foot (with specific Architectural approval, specific horizontal piping may have a pitch of not less than 1/8" per foot to local/state codes). Branch soil, waste and vent connections shall be run to the soil stack, waste stack, house drain or vent stack as shown on plans. Vertical vent pipes may be connected to main vent riser above fixtures vented. Where an end-circuit vent pipe from any fixture, or line of fixtures, is to be connected to a vent line serving other fixtures, the vent line shall be extended above the highest flood rim before being connected to the other vent lines, so as to prevent the use of any vent line as a waste pipe.
- B. All changes in pipe size on soil, waste and drain lines shall be made with reducing fittings or recessed reducers. Y-fittings and 1/8 or 1/16 bends or combination Y and 1/8 bends shall be used where possible.
- C. Sanitary long-sweep bends and T's shall be used for connection to branch lines for fixtures. On vertical runs of pipe, long-turn fittings shall be used wherever conditions permits.
- D. All horizontal lines not assigned invert elevations shall run at 1/4" per foot pitch. Check carefully all existing elevations before proceeding so as to keep within areas shown on Architectural Drawings. Where specific locations require less pitch, and where specific Architectural approval is received, specific horizontal piping may have a pitch of not less than 1/8" per foot to local/state codes).
- E. Where vent piping is run concealed in partitions, use special care to insure that all lines are maintained in their proper locations in the partitions so that no bends, fittings or parts of the piping will be visible.
- F. Vent or soil stacks run adjacent to the exterior walls of the building shall be offset back so that their roof penetrations will be inconspicuous from the street.
- G. Stainless steel coupling assemblies used in conjunction with No-Hub cast iron soil, waste and vent pipe shall be tightened to 60 inch-pounds torque on each nut or bolt head with a torque wrench specifically designed for the purpose. Each nut or bolt head shall be retorqued after not less than four (4) hours. The use of screwdrivers or other types of wrenches shall not be permitted for this purpose.
- H. In all cases, unless specifically indicated otherwise, pipes shall be installed within the heated building envelope and as close to overhead construction as conditions will permit to give maximum headroom and avoid structural members. Check all structural, architectural, electrical and heating/ventilating/air conditioning drawings to confirm that piping will not conflict with such work. Ensure all piping, valves and appurtenances are on the heated side of building insulation, unless specifically indicated otherwise.

3.2 WATER SERVICE:

- A. Existing water service shall remain and be reused for this renovation work

3.3 WATER PIPING INSTALLATION:

- A. All branches from mains shall be supplied with ball valves. Connections shall be made from the top of the mains, unless otherwise specified; branches shall drain toward the mains. The piping installation shall be so arranged that the entire system can be drained through accessible valves at low points; provide the necessary valves.
- B. Furnish and install a stop valve at each fixture supply. Also provide a water hammer arrester at each hot and cold water supply for each fixture. Where a branch supply serves more than one fixture piped within the same plumbing chase, one water hammer arrester may service the group of fixtures. Water hammer arresters shall be by Precision Plumbing Products, Inc. and shall be sized in accordance with the manufacturer's recommendations. Provide access doors to allow replacement of arresters.
- C. All piping shall be run concealed throughout finished spaces, either in furred spaces, shafts or above false ceilings, furred beams, etc., as indicated. Piping shall be run exposed in Mechanical Room and other areas where concealment is not possible.
- D. In all cases, pipes shall be installed within the heated building envelope and as close to overhead construction as conditions will permit to give maximum headroom and avoid structural members. Check all structural, architectural, electrical and heating/ventilating/air conditioning drawings to confirm that piping will not conflict with such work. Ensure all piping, valves and appurtenances are on the heated side of insulation.
- E. Provide chromed escutcheon plates at all exposed piping penetrations of walls, floors, ceilings and partitions.
- F. Water piping is not permitted in stairwells, except for piping directly supplying fixtures in these areas.

3.4 CLEANOUT INSTALLATION:

- A. Provide cleanouts of the same size as the line served up to 4", or of 4" size for larger lines, at the following locations: at base of each subsoil and waste stack, at changes in direction greater than 45 degrees in soil, waste, and drain lines in the building, at intervals not to exceed 50' in all runs of soil, waste, and drain lines, and elsewhere as shown on the drawings or as required by the State Building and Plumbing Codes. Final locations of visible finishes and locations shall be reviewed with and have approval of the Architect. Relocate as directed by the Architect at no additional cost to the owner.
- B. Cleanouts shall be extra heavy cast iron, with heavy brass or bronze plugs, and shall be extended to and brought flush with floor or wall surfaces. Plugs shall have countersunk nuts and shall be coated and installed so that they are readily accessible and removable for cleaning the lines.

3.5 VALVE INSTALLATION:

- A. Furnish and install valves where shown on the plans and where necessary to make the system complete in its operation. A valve shall be installed at the base of each new hot and cold water riser. All valves shall be located to permit easy system operation, replacement and repair, and to permit complete control of all plumbing systems.

3.6 HANGERS, ANCHORS, GUIDES AND SUPPORTS IN BUILDING:

- A. All piping shall be supported from the building structure by means of approved hangers and supports. Piping shall be supported to maintain required grading and pitching of lines, to prevent vibration, and to secure piping in place. Piping shall also be so arranged as to provide for expansion and contraction.
- B. Vertical cast iron soil pipe shall be secured at sufficiently close intervals to keep pipe in alignment and to support the weight of the pipe and its contents. Support stacks at their bases and at each floor interval using approved metal clamps or hangers for this purpose.
- C. Horizontal PVC piping suspended above grade shall be supported at four foot intervals to maintain alignment and prevent sagging or grade reversal. Hangers shall be located not more than 18" from the joints.
- D. Vertical copper tubing shall be supported at each floor interval for piping 1-1/2" and larger, and at not more than four foot intervals for piping 1-1/4" and smaller.
- E. Horizontal copper tubing shall be supported at six foot intervals for piping 1-1/2" and smaller and ten foot intervals for piping 2" and larger.

3.7 GROUNDS AND SUPPORTS:

- A. Unless otherwise specified, plumbing fixtures and accessories are to be secured to grounds or other woodwork with heavy, countersunk, steel wood screws.
- B. Coordinate the exact locations of wood blocking, backing or metal framing for the proper hanging of all fixtures.

3.8 PROTECTION OF FIXTURES:

- A. Protect against injury from building materials, acids, tools and equipment, all plumbing fixtures included in this section of the Specifications, with suitable and substantial covers. Any damage to, or replacement of, fixtures or equipment made necessary by failure of this Contractor to provide suitable protection, shall be paid for by this Contractor.

3.9 INSULATION:

- A. All insulation shall be applied in accordance with the recommendations of the manufacturer and in a neat and workmanlike manner by personnel regularly employed at this trade.

- B. Hangers in direct contact with cold water, storm and secondary roof drainage piping shall be insulated from the pipe to a distance of 6" along the hanger and rod with Zeston PVC tape, 10 mil thick, with pressure sensitive adhesive backing. Tape shall be spiral-wound with overlapping edges.
- C. Hangers on the exterior of insulated piping shall be supported by a rigid insert, minimum 12" long, to protect the insulation.

3.10 TESTING:

- A. After sanitary, waste and vent stacks are in place and before being concealed, plug lower ends and fill with water up to roof. Piping is to be left tight under these conditions and water level shall be maintained intact for a period of at least four (4) hours, but no less than as required by Local Authority.
- B. Test all water piping by applying a hydrostatic pressure of 125 PSI, using a pump for this purpose. Make sure that all lines are properly plugged or capped and their air has been vented before applying pressure which shall remain constant without pumping for one (1) hour. Provide testing at a higher pressure and/or for a longer period of time as required by the Authority having jurisdiction.
- C. Any leaks in joints or evidence of defective pipe or fittings disclosed by these tests shall be immediately corrected by replacing defective parts with new joints or materials and retested. Makeshift repairs effected by caulking threaded pipe with lead wool, or by application of wicking or patented compounds, shall not be permitted.
- D. Clean and disinfect all water piping by using the purging and disinfecting procedure described in AWWA C651, AWWA C652, or as prescribed by the Authority Having Jurisdiction.

END OF SECTION 22 10 60

SECTION 23 00 60

H.V.A.C.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, apply to work of this Section.
- B. The requirements specified in Section 22 00 50, "Basic Mechanical Requirements," apply to this Section.

1.2 INCLUDED IN THIS SECTION:

- A. Hot Water Heating Piping
- B. Insulation
- C. Pumps and Hot Water Specialties
- D. Boiler-Burner Units
- E. Breeching
- F. Baseboard Radiation
- G. Unit Heaters
- H. Piping

1.3 DESCRIPTION OF WORK:

- A. This Section includes the providing of all labor, materials, equipment, accessories, services and tests necessary to complete and make ready for operation by the Owner all heating, ventilating and air conditioning work as shown on the Drawings and called for in these Specifications. It is the intent of these Documents to terminate with complete, operational HVAC systems within the building.
- B. Also included, but not limited to, are the following items subject to applicable provisions of Section 15010, "Basic Mechanical Requirements," which are to be provided under this Section of the Specifications.
 - 1. Nameplates.
 - 2. Access doors: furnish to other Divisions.
 - 3. Tags and charts.
 - 4. Electric motors, magnetic starters and thermal protection.

5. Sleeves, inserts and anchor bolts.
6. Pipe expansion compensation.
7. Seismic requirements.
8. Plastic pipe markers.

1.4 WORK BY OTHERS:

A. The following work is included under other Divisions of the Specifications, except where otherwise indicated.

1. Concrete and masonry work.
2. Setting of access doors.
3. Finish painting.
4. Flashing of roof curbs or wall louvers.
5. Temporary heat.
6. Cutting and patching.
7. Excavation and backfill.
8. Leakage Testing and upgrading of thermal envelope to meet energy codes.
9. Disconnect switches for all motors: Division 16.
10. Thermal starting switches for all single phase motors: Division 16.
11. Manually operated devices such as pushbuttons and manual starters: Division 16.
12. Electric power wiring for all motors and controls: Division 16.
13. Mounting of all magnetic starters, except where furnished as an integral part of factory assembled equipment: Division 16.

1.5 SHOP DRAWINGS:

A. Furnish shop drawings (including product data) in accordance with the provisions set forth in Section 22 00 50, "Basic Mechanical Requirements." Shop drawings (including product data) shall be submitted on the following material, and equipment and systems.

1. Piping Fabrication Shop Drawings
2. Unit Heaters

3. Boiler-Burner Units
4. Pumps
5. Hot Water Specialties
6. Boiler Flue and Fabrication Shop Drawings
7. Baseboard Radiation
8. Insulation
9. Valves

1.6 ACCEPTABLE MANUFACTURERS:

- A. Subject to compliance with requirements, provide equipment or material of one of the following manufacturers.
- B. Insulation:
 1. Owens-Corning Fiberglas Corp.
 2. Johns Manville
 3. Knauf Fiber Glass
 4. CertainTeed Corporation
- C. Pumps and Water Specialties:
 1. ITT Bell & Gossett
 2. Aurora
 3. Taco, Inc.
 4. Armstrong
- E.. Valves:
 1. Crane
 2. Jenkins
 3. Fairbanks
 4. Apollo
 5. Nibco
- F. Boiler Burner Units:
 1. Smith Cast Iron Boilers

2. Weil McLain
3. Burnham
- G. Breeching:
 1. Metal-Fab, Inc.
 2. American Metal Products, Inc. (Div. of MASCO Corp.)
 3. Van Packer
- H. Baseboard Radiation:
 1. Sterling
 2. Vulcan
 3. Trane
 4. Ritling
- J Unit Heaters:
 1. Sterling
 2. Vulcan
 3. Trane
 4. Ritling

PART 2 - PRODUCTS

2.1 INSULATION AND THERMAL ACOUSTICAL LINING:

- A. General: Thermal acoustical lining and all insulation work shall be done by workers regularly employed in this field. Insulating work that does not present a workmanlike appearance will not be acceptable.
 1. Insulation, jackets and finish shall meet all applicable UL requirements and shall have a flame spread rating not exceeding 25 and smoke developed rating not exceeding 50.
 2. Insulation shall be installed in strict accordance with the manufacturer's recommendations.
 3. No covering shall be applied until all materials have been tested and approved.

B. Piping Insulation:

1. Insulate all hot and chilled water supply and return piping, condensate drain piping, steam piping, steam condensate piping and cold water make-up piping with Owens Corning Fiberglass ASJ pipe insulation having a factory applied all service jacket. Insulate refrigerant suction (RS) and liquid (RL) piping with weatherproof AP Armaflex insulation. Thickness of insulation shall be as follows. Runouts refer to piping to individual terminal units not exceeding 12'-0" in length.

<u>Piping Service</u>	<u>Piping Size</u>	<u>Insulation Thickness</u>
HWS,HWR 141-200 ⁰ F	Runouts	1"
	Up to 1-1/2"	1-1/2"
	Over 1-1/2"	2"

2. All flanges, valves bodies, pump bodies and fittings shall be insulated with molded or fabricated mitered segments of pipe insulation of a thickness equal to that off the adjoining pipe insulation, securely fastened in place and covered with Zeston covers.
3. Insulation shall be applied to clean, dry pipe with side and end joints butted tightly. Seal lap of jacket and butt joint strips with an approved lagging adhesive.
4. All piping shall be insulated and shall have color coded flow directional arrows added to ANSI Standards.
5. All heating supply and return piping, valves, hangers and accessories shall be on the heated inside of the building.

2.2 PIPING AND VALVES:

- A. Provide all necessary water specialties of B & G Manufacturer as shown or as required for the complete systems.

B. Valves shall be as follows:

- | | |
|------------------------------------|-------------------------------|
| 1. Gate Valves 2" and smaller: | 125 lbs. brass, screwed. |
| 2. Globe Valves 2" and smaller: | 150 lbs. screwed bronze. |
| 3. Angle Valves 2" and smaller: | 150 lbs. bronze, screwed. |
| 4. Check Swing 2: and smaller: | 125 lbs. bronze, screwed. |
| 5. Check Silent, all sizes: | 125 lbs. flanged, semi-steel. |
| 6. Drain Valves 2" and smaller: | 200 lbs. hose end, bronze. |
| 7. Blow-off Valves 2" and smaller: | 150 lbs. bronze, Y-type. |
| 8. Strainer 2" and smaller: | 225 lbs. screwed, bronze. |

- C. Provide drain valves at all low points of all water systems and where shown on Drawings. Provide air vents at all high points.

- D. Pipe and Fittings (unless specifically noted otherwise):

<u>Service</u>	<u>Component</u>
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Cold Water Make-up,
copper tubing ASTM B-88
Condensate Drain

Pipe: Type 'L' hard tempered

Lines/Fittings: Forged copper
with recessed ends for solder
joints.

Drain Traps: Deep seal suitable
for system static pressure.

Water Piping

Pipe: Schedule 40 black carbon
steel ASTM A-53A or
A-20.

Supply and Return
(Heated)

Fittings: Standard weight best
grey cast iron, 125 lbs., screwed
ends, 2- 1/2" and smaller. Long
turn welding fittings 3" and
larger.

2.10 METAL PIPE FABRICATION:

- A. All piping shall be fabricated and tested in accordance with the latest revision of Section 1 of the ASA-B31.1 "Code for Pressure Piping."
- B. All reductions in sizes of piping in the direction of downward pitch shall be installed with eccentric fittings to maintain a level top for water.
- C. Face bushings, close nipples or street ells shall not be used, except where specifically indicated.
- D. Outside surface at ends of copper pipe and inside surfaces of fittings shall be thoroughly cleaned with steel wool or emery cloth and all burrs shall be removed. After cleaning, surfaces to be jointed shall be evenly and completely covered with flux.
- E. Joints shall be well supported during the heating process and shall not be strained during the cooling period.
- F. All soldered joints shall be made with 95-5 wire solder. Paste or liquid solder will not be allowed. Excess solder shall be removed while still in a plastic state, leaving a fillet around the cup as it cools.

2.11 PRESSURE GAUGES:

- A. Pressure gauges shall be steel encased Bourdon type with snubber orifice and all working parts of corrosion resistant metal. They shall be four inches (4") in diameter, suitable for service in all cases and have easily read properly graduated faces in both PSI and feet of head for the systems pressures. It shall be possible to see and read all gauges from normal viewing angles and heights. Provide snubbers and petcock shutoff for all gauges.
- B. Pressure gauges shall be provided where noted on the plans and at each piece of equipment (both supply and return side).

2.12 THERMOMETERS:

- A. Thermometers shall be of the bimetal dial type with a four inch (4") face and separable socket suitable for the system pressure and temperature ranges. Faces shall be graduated in the largest suitable increments for each service and shall be installed to allow easy reading from normal viewing angles and heights. Remote capillary types shall be used where direct type cannot be read.
- B. Thermometers shall be installed where noted on the plans and at each piece of equipment (both supply and return side).

2.13 MACHINERY GUARDS:

- A. All exposed moving parts such as pulleys, belts, shafts and couplings shall have #16 gauge expanded metal ½" mesh guards with 1-1/4" X 1-1/4" X 1/8" angle iron frames properly supported and shall be removable. The entire assembly shall be rattle free.
- B. Opening for tachometer readings shall be provided opposite rotating shafts.

2.14 VIBRATION ISOLATION:

- A. All mechanical equipment shall be mounted and isolated from the building structure by vibration isolators. All vibration isolators shall be as manufactured by Mason Industries or approved equal.
- B. Rubber-in-shear isolators shall be properly housed and provided with adequate facilities for bolting. Spring isolators shall be equipped with sound deadening pads, snubbers and leveling bolts and shall be free standing for deflections over 1". All spring isolators shall be properly sized by the manufacturer according to load and deflection. Efficiency of isolation shall not be less than 95%.
- C. Refer also to "Seismic Requirements" in Section 15010.

2.15 BOILER BURNER UNIT

- A. Boiler shall be of rugged cast iron construction with cast iron sections and shall include higher heat retention, better combustion and quiet operation. The cast iron sections shall be factory tested and assembled with steel push nipples.
- B. Provide a The Hydrostat Temperature Limit Control uses Thermal Targeting technology to analyze thermostat activity and continually evaluates how much heat the building requires.
- C. On a call for heat, the unit will energize the circulator pump to drive the residual latent heat from the boiler to the heating zone in an attempt to satisfy the heat demand without firing up the burner. .
- C. The manufacturer shall provide an automatic vent damper to close during the off cycle of each boiler to minimize stand-by losses. Auxiliary motorized automatic vent damper shall be separately furnished for the boiler draft hood. Vent stack damper shall be UL listed. This damper shall be wired into the burner control circuit. Complete installation shall be to manufacturer's requirements.

- D. Cast Iron Sections – Factory Tested and Assembled with Steel Push Nipples • Deluxe Powder Coated Steel Insulated Jacket • Preformed Target Wall
1. Full Swing-out Service Door
 2. Easy Top Cleanout Access
 3. Rear or Top Flue Convertibility (3 & 4 Sections)
 4. Built-In Air Elimination Port
 5. Molex quick electrical to burner.
 6. Hydrostat Combination Low
 7. Water Cut-off and Universal
 8. Temperature Limit Control
 9. DHW Priority with Override Protection
 10. Hydrostat Provides Cold-Start and Tankless Coil Operation
 11. ASME Safety Relief Valve (30 psi)
 12. Temperature-Pressure Gauge
 13. Taco Circulator
 14. Drain Valve
- E. Automatic vent damper shall be installed in such a way that the housing is not used to provide physical support of the breeching which if required shall be provided by hangars, straps or posts. All wiring to and from the automatic vent damper shall be protected from the flue pipe or any other high heat source and precautions during installation shall be taken to allow for unrestricted differential of expansion of the vent casting and the flue pipe so as to prevent shifting and binding of the damper during normal operation.
- G. Boilers shall be factory assembled and packaged with flue exiting the rear of the boiler. For installations requiring a top flue, simply remove jacket top and reverse flue director to top.

2.16 HOT WATER PUMP:

- A. Provide circulating pumps of size, type and capacity as noted on the Drawings.
- B. Pumps shall be bronze fitted, complete with mechanical seals, split vertical case, keyed impellers, flexible couplings, dripproof motors, resilient mounting and all accessories.

- C. Pumps shall include flexible couplings, oil lubricated bearings, mechanical seals to 240°F and resilient mounted motors. Provide rigid base plate on base mounted pumps.
- D. The motor shall be non-overloading at any point on the pump curve.
- E. Pumps shall each be with a listed capacity and motor as shown on drawings. Provide H.O.A. starter arranged for automatic temperature control.
- F. Each pump starter shall be provided complete with pilot lights to indicate operation.
- G. Provide all motors (efficiencies) to meet maximum utility rebate.
- H. Provide all pumps with variable frequency drives and controllers. (Refer to VFD subsection).

2.17 COMPRESSION TANK AND HOT WATER SPECIALTIES:

- A. Provide compression tank for water systems of size and capacity noted on the Drawings. Tank shall be fabricated and tested in accordance with the ASME Code for "Unfired Pressure Vessels" and shall be so stamped. Test pressure: 188 psi.
- B. Manual vents shall be provided wherever necessary throughout the water system for initial venting of the system.
- C. Provide all necessary water specialties as shown or as required for complete system. In-line air separator shall be installed to serve each water system.

2.18 BOILER FLUES:

- A. Provide complete factory-built flue system of size and type as noted on the Drawings.
- B. Double wall exhaust piping shall have an outer jacket of 316 stainless steel 0.025" thick and a minimum of 1" air space between walls (size per model number). The inner gas carrying pipe shall be type 316 stainless steel 0.035" thick.
- C. All exhaust piping, supports, guides, etc. shall be installed in accordance with manufacturer's requirements, state codes, local codes, and NFPA standards.
- D. Each system shall be U.L. listed Metalfab Type IPIC-2, complete with ventilated thimble, and other accessories as required.
- E. Submit manufacturers fabrication drawing with all draft calculations and sizings listed. Include all barometric dampers as required.

2.19 UNIT HEATERS:

- A. Provide suspended unit heaters of size, type and capacity as scheduled on the plans.

- B. Units shall be quiet operating, complete with finned coil of heavy wall seamless copper with aluminum fins and rated at 150 PSIG.
- C. Unit casing shall be die formed steel, phosphatized and finished baked enamel.
- D. Fans shall be motor driven propeller type with resilient mounted motors.
- E. Units shall be complete with adjustable outlet louvers and wire guard over fan.
- F. Units shall be as manufactured by Sterling.

2.20 RADIATION:

- A. Where damaged cast iron radiators exist, in lieu of replacing, alternately provide fin-tube radiation with active finned element lengths matching the load of the cast iron sectional radiators being replaced.
- B. Enclosures shall extend wall to wall unless indicated otherwise. Field measure prior to fabrication.
- C. Radiation shall be complete with full 18 gauge rigid dieformed back plates, 14 gauge steel enclosures with pencil proof louvered discharge grille and inlet grille (on bottom), air seal gasket at top of backplate, slip joint connections, fully modulating damper with tamper proof socket head operator, slide cradle type adjustable hangers to permit expansion and contraction, without noise, end caps, corner pieces and all accessories including anchor type enclosure supports. Provide 2'-0" long removable cover section for access to air vents and valves. Each 2'-0" long removable cover section shall be able to be removed without disturbing adjacent radiation covers; allow sufficient gap behind end trim to allow for this.
- D. Radiation enclosures shall have baked enamel finish. Custom color shall be selected by Architect; submit color selection charts.

2.21 SUBMITTALS

- 1. Submit shop drawings and product data under provisions of the Contract Documents that apply to the work in this section.
- 2. Submit manufacturer's installation instructions under provisions of the Contract Documents that apply to the work in this section.

2.22 OPERATION AND MAINTENANCE DATA

- 1. Submit operation and maintenance data under provisions of the Contract Documents that apply to the work in this section.
- 2. Include assembly views and replacement parts lists.

2.23 DELIVERY, STORAGE, AND HANDLING

- 1. Deliver products to site under provisions of the Contract Documents that apply to the work in this section.

2. Store and protect products under provisions of the Contract Documents that apply to the work in this section.

PART 3 – EXECUTION

3.1 PIPING INSTALLATION AND SUPPORT:

- A. All piping shall be grouped wherever practical and properly aligned in straight parallel lines. Pipe shall be spaced to allow for full insulation and to permit access for service and operation of valves and other accessories. The exact locations of piping and related equipment are not necessarily as indicated on the Drawings and shall be determined by actual field conditions to permit maximum ease of service and accessibility consistent with a neat and workmanlike installation. It shall be understood that the locations of piping, valves, controls, equipment, etc., are subject to such modifications as may be found necessary or desirable at the time of the installation in order to meet any structural or mechanical conditions. Such changes shall be made by this Section, upon approval by the Architect, without extra charges.
- B. Connections of dissimilar metals between pipe, fittings, hangers, equipment, etc. shall be avoided wherever practical. Wherever such connections are unavoidable they shall be insulated against direct contact with high grade dielectric fittings.
- C. Piping shall be cut accurately to measurements established at the site and shall be worked into place without springing or forcing.
- D. Piping shall be pitched for proper circulation and drainage. Supply runouts shall pitch upward in the direction of flow. Drain piping shall pitch a minimum of 1/4" per foot down in the direction of flow, unless noted otherwise.
- E. Piping shall be supported, guided and anchored to prevent creeping, sagging, buckling, vibration or misalignment.
- F. Pipes shall not be hung from other piping or from equipment of other trades, and hanger rods shall not pierce ducts without specific approval.
- G. Wire, chain, bank iron, tape or wood hangers shall not be used to support piping.
- H. Pipe supports shall be capable of vertical adjustments after installation of piping.
- I. Piping of all equipment and control valves shall be supported to prevent strains or distortions in the connected equipment and control valves. Piping shall be supported to allow for removal of equipment, valves and accessories with a minimum of dismantling and without requiring additional supports after these items are removed.
- J. Pipes shall be supported at all changes in direction and at intervals of not more than 10 feet on straight runs. Supports shall be subject to the Architect's approval.

- K. Piping at ceiling shall be supported on clevis, roller or trapeze hangers, with rods suspended for inserts.
- L. Piping at floor shall be supported on offset clamps, floor stands or roller stands fastened to concrete piers.
- M. Piping at walls shall be supported on hook plates, offset clamps or wall brackets with U bolts or roller stands.
- N. Where building construction is not suited to these methods of supporting piping, supports shall be as detailed on the Drawings or as approved by the Architect.
- O. Trapeze hangers shall consist of two (2) structural steel channels bolted back to back with space between for hanger rods and hold down bolts or one of the formed steel systems with appropriate clamps and fittings.
- P. Hanger rods shall be fully threaded and galvanized and shall be secured in place with double nuts and lock washers.
- Q. Anchors shall be as approved by the Architect.
- R. Wherever insulated piping is to be installed on supports, protection saddles shall be welded to bottom of pipe to provide a bearing surface and to protect the insulation.
- S. Wherever cold insulated pipe is installed, curved steel plate half-sleeves shall be cemented to the lower half of the outside surface of the insulation to provide a bearing surface and to protect the insulation.
- T. All hangers and supports shall be finished by other Divisions with two (2) coats of zinc chromate paint. Coordinate all quantities and locations.
- U. Vertical pipes shall be supported at the bottom on base elbows or floor stands fastened to concrete piers.

3.2 METAL PIPE FABRICATION

- A. All piping shall be fabricated and tested in accordance with the latest revision of Section 1 of the ASA-B31.1 "Code for Pressure Piping."
- B. All reductions in sizes of piping in the direction of downward pitch shall be installed with eccentric fittings to maintain a level top for water.
- C. Face bushings, close nipples or street ells shall not be used, except where specifically indicated.
- D. Outside surface at ends of copper pipe and inside surfaces of fittings shall be thoroughly cleaned with steel wool or emery cloth and all burrs shall be removed. After cleaning, surfaces to be jointed shall be evenly and completely covered with flux.
- E. Joints shall be well supported during the heating process and shall not be strained during the cooling period.

- F. All soldered joints shall be made with 95-5 wire solder. Paste or liquid solder will not be allowed. Excess solder shall be removed while still in a plastic state, leaving a fillet around the cup as it cools.

3.3 AUTOMATIC TEMPERATURE CONTROLS

- A. Provide a complete and fully operational automatic temperature control system as specified.

3.4 STARTING UP:

- A. Prior to starting up the system, flush all system piping and ducts until clean. Any damage to the building or system components caused by failure to clean the system properly, shall be corrected to the satisfaction of the Architect and the cost shall be paid for by this Section. Eliminate all noise and vibration, and take all measures to secure proper circulation.

3.5 TESTS:

- A. Equipment: Demonstrate that all equipment and apparatus fulfill the requirements of the Drawings and the Specifications. All equipment shall be operated and tested for rated capacities and specified characteristics. Voltage and amperage readings shall be taken on all electric motors.
- B. Air Systems: Air systems shall be initially balanced to achieve the specified CFM. Final balance shall be done to maintain even space temperatures under occupied load conditions.
- C. Test Log: Five (5) copies of a complete tabulated log of all test readings including pressures, temperatures, R.P.M., electric motor voltage and current shall be submitted to the Owner for approval. Water balancing shall be performed to achieve even temperature drops throughout the systems. Pump readings shall also be taken and submitted.

END OF SECTION 23 00 60

SECTION 26 00 50

BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, apply to work of this Section.

1.2 INCLUDED IN THIS SECTION:

- A. General Requirements for Electrical Work
- B. Nameplates
- C. Access Doors
- D. Sleeves, Inserts, and Anchor Bolts
- E. Firestopping

1.3 DESCRIPTION OF WORK:

- A. This Section specifies general requirements for electrical work. Definitions, intent, drawings, interpretation of documents, approvals, submittals, substitutions, code requirements, permits, fees, royalties, patents, record drawings, instruction of Owner's personnel, and warranty are described.
- B. Operation and maintenance manuals shall be submitted to the Architect prior to the scheduled instruction of Owner's representatives. These manuals shall contain equipment lists, manufacturer's literature, and time schedule for recommended maintenance.

1.4 DEFINITIONS:

- A. "Provide" means to supply, erect, install, and connect up in complete readiness for regular operation, the particular work referred.
- B. "Furnish" means to supply and deliver to the job.
- C. "Install" means to erect, install and connect up in complete readiness for regular operation.
- D. "Conduit" includes, in addition to conduit, all fittings, sleeves, connections, hangers, and other accessories related to such conduit.

- E. "Wiring" means, in addition to wire, all needed connectors, circuit breakers, switches and devices, junction boxes and other items necessary for normal operation of the item being referred to.
- F. "Concealed" means hidden from sight, as in chases, furred spaces, shafts, hung ceilings, or embedded in construction.
- G. "Exposed" means not concealed as defined above. Trenches, crawl spaces, and tunnels shall be considered exposed.
- H. "Governmental" means all Municipal, State, and Federal governmental agencies.
- I. "Owner" means the property owner, Ronald Terebisi, Jr., who shall take occupancy of the space after final acceptance.
- J. "Extend" means to supply, erect, install and connect up in complete readiness for regular operation the particular work referred.
- L. "Architect" shall mean Martinez Couch & Associates, LLC.

1.5 INTENT:

- A. It is the intention of the Drawings and Specifications to call for finished work, tested and ready for operation. All materials, equipment and apparatus shall be new and of first class quality.
- B. Any apparatus, appliance, material, or work not shown on the Drawings, but mentioned in the Specifications, or vice versa, or any incidental accessories, or minor details not shown, but necessary to make the work complete and perfect in all respects, and ready for operation, even if not particularly specified, shall be provided by the Contractor without additional expense to the Owner.
- C. With the submission of bid, the Contractor shall give written notice to the Architect of any materials, apparatus or omissions believed to be in violation of laws, ordinances, rules or regulations or authorities having jurisdiction. In the absence of such written notice it is mutually agreed that the Contractor shall include the cost of providing all systems in accordance with applicable regulations without extra compensation.

1.6 DRAWINGS:

- A. The Drawings are generally diagrammatic and are intended to convey the scope of work and indicate general arrangement of equipment, conduits, piping, fixtures and connections.
- B. Consider architectural and structural drawings part of this work insofar as these drawings furnish information relating to design and construction of the building.

- C. The drawings do not indicate all offsets, fittings, and accessories which may be required. Investigate structural and finish conditions affecting this work, and arrange work accordingly, providing such fittings, valves, and accessories required to meet the conditions.
- D. The locations of all items shown on the Drawings or called for in the Specifications that are not definitely fixed by dimensions, are approximate only. The exact locations necessary to secure the best conditions and results must be determined at the project, and shall have the approval of the Architect before being installed. DO NOT SCALE DRAWINGS.
- E. Follow Drawings as closely as actual building construction will permit in laying out work. Check Drawings for other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions throughout. Where headroom or space conditions appear inadequate, the Architect shall be notified before proceeding with installation.
- F. If directed by the Architect, the Contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.

1.7 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS:

- A. Any questions or disagreements arising as to the true intent of this Specification or the Drawings, or the kind and quality of work required thereby, shall be decided by the Architect, whose interpretations thereof shall be final, conclusive and binding on all parties.
- B. In the case of disagreement between Drawings and Specifications, or within either document itself, the better quality, greater quantity or more costly work shall be included in the contract price, and the matter referred to the Architect's attention for decision and/or adjustment.

1.8 APPROVALS:

- A. The materials, workmanship, design and arrangement of all work installed under the Contract shall be subject to the approval of the Architect. If material or equipment is installed before it is approved, the Contractor shall be liable for removal and replacement, at no extra cost to the Owner, if, in the opinion of the Architect, the material or equipment does not meet the intent of the Drawings and Specifications.

1.9 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES:

- A. The Contractor shall submit five (5) copies of Shop Drawings, Product Data and/or Samples to the Architect for review prior to releasing an order for fabrication and/or shipment. These submittals shall be given for materials and equipment and as called for under each particular Section of the Specifications.
- B. Product Data submittals shall consist of complete catalog data clearly indicating all applicable items, in the following manner:

1. State sizes, capacities, brand names, motor HP, accessories, materials, gauges, dimensions, and other pertinent information.
 2. List on catalog covers page numbers of submitted items.
 3. Underline applicable data. Highlighting applicable data is not sufficient.
 4. Job specific wiring diagrams and riser diagrams showing all equipment, devices, and wiring.
 5. Lay outs of Equipment Room.
 6. Submit Fault Current Calculation for each panel.
 7. Submit product information systems as a complete package (ie..submit all lighting fixture types as one submittal).
- C. Incomplete or unclear submittals will be returned unreviewed for correction and resubmission. Additional copies beyond five (5), or submittals of items other than what is called for under each particular Section, will be returned unreviewed.
- D. Submittals of equipment or materials other than those indicated on the Drawings or in the Specifications will be returned unreviewed, except for reasons as noted under SUBSTITUTIONS.
- E. This Division shall coordinate all aspects of respective subsections with the contractor including material data, overall drawings, installation sequencing, etc. See Division 1 requirements.

1.10 SUBSTITUTIONS:

- A. Substitutions of equipment or materials other than those shown on the Drawings or called for in the Specifications will be considered for review only under one or more of the following conditions.
1. Less than three (3) acceptable manufacturers are indicated on the Drawings or in the Specifications.
 2. Substitution is required for compliance with subsequent interpretations of code requirements or insurance regulations.
 3. Substitutions is required due to unavailability of special products, through no fault of the Contractor. Excluded is lack of availability within a desired time frame due to Contractor's failure to order equipment or material early enough.
 4. Manufacturer/fabricator refuses to certify or guarantee performance of specified product as required.
- B. The particular condition necessitating a substitution must be clearly indicated on the substitution's transmittal or it will be returned unreviewed.

- C. The Contractor shall submit a substitution for review before releasing an order for fabrication and/or shipment. The Architect reserves the right to reject such substitution, provided the item offered, in his opinion, is not equal to the item specified.
- D. When a Contractor proposes to use an item of equipment other than that specified or detailed on the Drawings, and which requires any redesign of structure, partitions, foundations, piping, wiring, or of any other part of the electrical, or architectural layout, the Contractor shall assume responsibility for additional costs incurred in planning, design and construction to accommodate the substitution. If approved by the Architect, redesigned drawings and details to accommodate the substitution may be prepared by the Contractor at his own expense.
- E. If a substitution requires a different quantity and arrangement of wiring, conduit, and equipment from that specified or indicated on the Drawings, subject to approval of the Architect, the Contractor shall provide any such piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

1.11 CODE REQUIREMENTS, PERMITS AND FEES:

- A. Perform work in accordance with applicable provisions of the accepted version of NFPA codes, including the National Electric Code and Life Safety Code, and all state and local codes. All work shall also be in compliance with utility companies' requirements.
- B. In cases of differences between building codes, state laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Promptly notify Architect in writing of such differences.
- C. Include in the work, without extra cost to the Owner, any labor, material, service, test, apparatus, or drawing (in addition to Contract Drawings and Documents) in order to comply with applicable laws, ordinances, rules, regulations, and local authority's requirements, whether or not shown on Drawings and/or specified.
- D. Give all necessary notices, obtain all permits and pay all governmental taxes, fees and other costs in connection with the work. File all necessary plans, prepare all documents, and obtain all necessary approvals of the governmental departments having jurisdiction. Obtain all required Certificates of Inspection for the work, and deliver them to the Architect before request for final payment for the work.
- E. Contractor shall ensure that all system components, methods of installation and materials complies with ASTM, OSHA and Owner's standards for off-gassing.
- F. The Contractor shall be licensed in accordance with the guidelines of the Department of Consumer Protection. The workers employed by the Contractor shall be skilled and licensed to perform the work involved.

1.12 ROYALTIES AND PATENTS:

- A. The Contractor shall pay all royalties and shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof.
- B. If the Contractor observes that a process or article specified is an infringement of a patent, the Contractor shall promptly notify the Architect in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work. If the Contractor performs any work specified, knowing it to be an infringement of a patent, the Contractor shall bear all costs arising there from.

1.13 RECORD DRAWINGS:

- A. Clearly record differences between mechanical and electrical work as installed and as shown or called for in the Contract Documents. Accurate notations of all locations, sizes and inverts of all concealed materials shall be made. These records shall be marked, concurrent with progress, on a set of prints labeled "RECORD DRAWINGS."
- B. On completion of project, mark a set of prints with data transferred from the Record Drawings, and submit them to the Architect for review for legibility and clearness of presentation of the recorded conditions of construction.

1.14 INSTRUCTION OF OWNER'S PERSONNEL:

- A. After completion of all work and all tests and at such time as designated by the Owner's representative, the Contractor shall provide the necessary skilled personnel to operate each entire installation for a period of two (2) days of eight hours.
- B. During the operating period, the Contractor shall fully instruct the Owner's representative in the complete operation, adjustment, and maintenance of the entire installation.

1.15 OPERATION AND MAINTENANCE MANUALS:

- A. Prepare a manual of operation and maintenance instructions, in draft form, and submit to the Architect for review.
- B. The Manual shall contain the following items:
 - 1. Brief description of each system covering its basic operating characteristics.
 - 2. List of all equipment with manufacturer's name and model number for each item.
 - 3. Contractor's own written operating and maintenance instructions.
 - 4. Copies of submittals having final review stamps.
 - 5. Manufacturer's bulletins, data, parts lists, operating and maintenance instructions, guarantees and any other information pertinent to the proper operation of each system and item of equipment installed, including service manual which covers disassembly, reassembly of the equipment and trouble shooting.

6. Information of actions to be taken in the event of a malfunction or other emergency.
 7. Provide a programming ability (CD, etc.) literature.
 8. Provide a copy of the original program.
 9. Time schedule for recommended maintenance operation.
 10. Programming software for fire alarm equipment.
- C. At least two weeks prior to the scheduled instruction of Owner's representatives, provide the Architect with five (5) complete copies of the final form of the Operation and Maintenance Manual, bound in booklet form in durable binders and suitable indexed.

1.16 WARRANTY:

- A. The Contractor shall warrant that all work installed will be free from any and all defects, and that all apparatus will develop capacities and characteristics specified, and that if, during a period of one (1) year from date of completion and acceptance of the work, any such defects in workmanship, materials, or performance appear, the Contractor shall immediately replace, repair or otherwise correct the defect or deficiency without cost and within a reasonable time to be specified in writing to the Owner.
- B. The Contractor shall also replace or repair, to the satisfaction of the Owner and Architect, all damage done to any material or finish in consequence of work performed in fulfilling the warranty.
- C. In the case of default on this warranty by the Contractor, the Owner may have such work done as required, and charge the cost to the Contractor.

1.17 VISITING THE SITE:

- A. Before submitting a final proposal, the Contractor shall examine the site of the proposed work to determine the existing conditions that affect the work. The Contractor will be held responsible for any assumptions made by him in regard thereto. Time for this examination must have prior approval of the Owner.
- B. No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions.

1.18 EXISTING SYSTEMS:

- A. Prior to bid, the Contractor shall make a detailed examination of the existing building including all existing services and systems to become thoroughly familiar with the scope of work and working conditions. Contractor shall pay particular attention to all existing services and interconnecting systems. All existing systems shall remain in operation at all times except as otherwise arranged under SHUTDOWNS.

- B. The Contractor shall include, in his proposal, for all necessary relocation or revamping of such services and systems, where necessitated by the renovation work, to provide a finished final project. All relocation or revamping shall be provided by the Contractor without additional cost to the Owner, and shall be arranged, as directed by the Architect in the field, to be encased in a finished manner within the building. Any equipment or material to remain or be reused that may be damaged during construction shall be replaced by the Contractor at no additional cost to the Owner. Any existing equipment or material to be removed shall be disposed of by the Contractor or stored by the Contractor, as directed by the Owner.
- C. Prior to performing any work on an existing system, this Contractor shall test to ensure operational said system and submit a written report to the Architect stating the status of the system.

1.19 SHUTDOWNS:

- A. When installation of a new system, or modification of an existing system, requires the temporary shutdown of an existing operation, the connections of the new system, or modified system, shall be performed at such time as designated by the Owner, in writing. Shutdowns shall be staged for minimum downtime.
- B. The Owner shall be notified of the estimated duration of the shutdown period at least ten (10) days in advance of the date the work is to be performed.
- C. Work shall be arranged for continuous performance, including overtime if required, to assure that existing operating services will be shut down only during the time actually required to make necessary connections.
- D. Where any disruption of systems or services serving life safety or critical functions are necessary, the Contractor shall provide and pay for outside additional services, equipment and operations as may be required by the Authority Having Jurisdiction, to provide constant, around-the-clock protection throughout the entire affected areas.

1.20 SPECIAL PROVISIONS DURING CONSTRUCTION

- A. During the course of construction when and where required by the Authority Having Jurisdiction, the contractor shall provide the services, personnel, vehicles, equipment and operations as may be required including, but not limited to: local fire department personnel, vehicles and equipment for an approved "fire watch"; on-site local fire department equipment, tankers, pumpers, trucks and aerial vehicles; local police department personnel, vehicles and equipment; ambulance personnel, vehicles and equipment; and utility company's personnel, vehicles and equipment, etc., as may be required or necessary.

1.21 EXISTING FACILITY:

- A. All work within the existing facility shall be done at a time prearranged with occupants so as to minimize disturbing the facility's operation.

- B. As the buildings will remain occupied during the course of construction, extreme care shall be exercised by the Contractor to protect the occupants and their furnishings and belongings from damage due to the renovation and modernization work being performed.

1.22 FINAL ACCEPTANCE:

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following list exceptions in the request.
1. Submit the final payment request to the Architect with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 2. Submit an updated final statement to the Architect, accounting for final additional changes to the Contract Sum.
 3. Submit a certified copy of the Architect's Final Inspection list of items to be completed or corrected, stating that each item has been completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
 4. Submit consent of surety to final payment.
 5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Reinspection Procedure: The Architect will reinspect the Work upon receipt of notice from the Contractor that the Work, including Final Inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.
1. Upon Completion of reinspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, reinspection will be repeated, and the Contractor will bear the cost.

1.23 COORDINATION DRAWINGS:

- A. The contractor is to prepare and submit coordination drawings for each trade detailing all systems and components including but not limited to:
- Electrical equipment components and all associated accessories.
 - Electrical Fixtures
 - Conduits, Junctions boxes and all associated accessories.
 - Lay out of Electric Rooms.

- B. Drawings are to be to scale: (1/4" = 1'-0" Min.) indicating all the latest architectural and structural components. Coordination drawings are to be in addition to any individual submittals of associated items. Each trade must sign-off on coordination drawings indicating respective trade disciplines have been coordinated. Each trade contractor must include in their bid all associated cost for such coordination drawings. Contractor to indicate respective costs on billing schedule of values.
- C. Contractor shall prepare coordination drawings and installation layouts. Such drawings shall consist of dimensioned plans and elevations, and shall give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc. Such drawings shall incorporate all trades.
 - 1. Accurate structural steel locations shall be represented on the composite shop drawings, as the basis for coordination by the trades.
- D. These coordination shop drawings and field installation layouts shall be coordinated in field by Contractor and his subcontractors for proper relationship to work of other trades, based on field conditions, and shall be checked for accuracy and accepted by them before submission to Architect for his final acceptance. Contractor shall have competent technical personnel readily available for such coordination and checking as well as for supervision of field installation of work in accordance with shop drawings and field installations as determined by the Contractor to be correct and carrying Architect's submittal review stamp.

PART 2 - PRODUCTS

2.1 MANUFACTURER'S IDENTIFICATION:

- A. Manufacturer's nameplate, name, or trademark shall be permanently affixed to all equipment and material furnished under this Specification. The nameplate of a subcontractor or distributor will not be acceptable.

2.2 NAMEPLATES:

- A. The Contractor shall provide for each item of equipment, including panels, a permanently attached nameplate made of laminated bakelite with incised letters; nameplate shall have black surface and white core.
- B. Nameplates shall be a minimum of 3" long by 1-1/2" wide and shall bear the equipment name and item as designated in the equipment schedule.
- C. All panel directories shall be typed, indicating what each circuit breaker or fuse controls.
- D. Tape Labels: Embossed adhesive tape with 3/16" white letters on black background.
- E. Wire and cable markers: Cloth markers split sleeve or tubing type.

2.3 ACCESS DOORS:

- A. Furnish access doors to provide access to pull boxes and junction boxes, etc. concealed behind finished construction. Doors shall have a fire-resistance rating classification to match the construction which they are installed in. Doors shall be of the flush type with Allen head-operated cam lock, 16-gage anchor frame, and hinged panel, as manufactured by Goal Inc., Karp Associates Inc., or Milcor. Minimum size shall be 12" x 12". Doors shall be furnished by Division 16 for installation by other Divisions.

2.4 SLEEVES, INSERTS AND ANCHOR BOLTS:

- A. Each section of Division 16 shall be responsible for the location and proper position of sleeves and anchor bolts. If failure to do so requires cutting and patching of finished work, it shall be done at no extra cost to the Owner.
- B. Conduits passing through concrete or masonry floors, walls or partitions shall be provided with sleeves having an internal diameter 1/2" larger than the outside of the conduit. Seal to maintain fire ratings.
- C. Sleeves through concrete floors or interior masonry walls shall be Schedule 40 black steel pipe, set flush with wall, floor or ceiling surface. Sleeves through floors shall be sealed with a fireproof, resilient material to maintain the fire rating integrity of the assembly.
- D. Sleeves through floors of wet areas such as equipment rooms, toilet rooms, etc., shall extend 2" above finished floor surface and be sealed as noted above. In addition, caulk with waterproof compound to the approval of the Architect.

2.5 FIRESTOPPING:

- A. Requirements: Conduits, cables, and busways that penetrate fire rated walls or floors shall be sealed by means of a U.L. listed system. Refer to the U.L. Fire Resistance Directory, Vol.II, 1993 edition. Other equivalent third party testing agencies, such as Factory Mutual Systems Approval, are acceptable. Conduit penetrating framed walls shall meet UL No. 187 requirements, and conduit piping penetrating concrete floor or block walls shall meet UL No. 281 requirements.
- B. Submittals: Submit manufacturer's literature, specifications, installation instructions and material safety data sheets for the product(s) intended for use. Include with the submittal a list of all walls and floors that are to be penetrated, cross referenced to the U.L. system to be used. Where designated on the plans, use a system that is capable of retrofit without damage to the system. Failure of the Architect or Engineer to designate a required firestop does not relieve the Contractor of the responsibility to provide an approved system.

- C. Design: Unless otherwise specified, the "F" rating (burn thru time) of the system(s) shall be equal to or longer than the wall or floor being penetrated. Where penetrants pass thru finished walls and floors, the firestop materials when cured shall be compatible with the wall or floor finish. (For example, a firestop thru a painted block wall shall be sandable and paintable.) Where open (as opposed to closed piping) penetrants such as cable tray or busway are fire-stopped, the individual conductors shall be properly sealed by means of a cable sealant or factory installed, U.L. listed internal (in the case of busway) firestop or other approved method. Fire stop system shall meet the following: ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops, ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials and ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- D. Installation: All seals shall be installed in accordance with the manufacturer's design and instructions. Demonstrate to the Architect that the installer is capable of installing each system properly by submitting samples or by performing one or more installations in the presence of the Architect. Include with the Record Drawings a U.L. system number for each firestop.
- E. Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following:
1. Dow Corning Corporation
 2. 3M Fire Protection Products
 3. International Protective Coatings
 4. HILTI, Inc.

2.6 MATERIALS AND EQUIPMENT:

- A. Prior to ordering or use of any material or equipment, it shall be the sole responsibility of the Contractor to ensure that the manufacturer certifies in writing that all material and equipment supplied is suitable and approved by code, and in accordance with the manufacturer's recommendations and installation instructions for use in the particular manner and location intended. Contractor shall make due allowance for this in the bid and shall include any accessories or revisions required at no additional charge.
- B. New materials and equipment installed into existing work shall be compatible with the existing work. The Contractor shall advise the Architect before ordering and/or installing any materials or equipment if he disputes those items and/or methods specified. Otherwise, the Contractor shall take full responsibility for their performance and suitability.
- C. All equipment shall be Year 2000 compliant, tested and proven by manufacturer. Provide owner with manufacturer's certification of Year 2000 compliance.

PART 3 - EXECUTION

3.1 PROTECTION OF WORK AND PROPERTY:

- A. The Contractor shall be responsible for the maintenance and protection of all equipment, materials and tools supplied by the Contractor and stored or installed on the job site, from loss or damage of all causes, until final acceptance by the Owner.
- B. The Contractor shall be responsible for the protection of any finished work of other trades from damage or defacement by the Contractor's operation and must remedy any such injury at the Contractor's own expense.

3.2 SCAFFOLDING, RIGGING, AND HOISTING:

- A. The Contractor shall provide all scaffolding, rigging, hoisting and services necessary for erection and delivery into the premises for all equipment and materials furnished, and remove same from premises when no longer required.

3.3 CUTTING, PATCHING, EXCAVATION AND BACKFILL:

- A. All cutting, patching, excavation and backfill shall be provided by other Divisions. Coordinate all requirements well in advance.

3.4 ACCESSIBILITY:

- A. The Contractor shall install all items so that parts requiring inspection, maintenance and repair are readily accessible. Minor deviations from the Drawings may be made to accomplish this, but changes of magnitude shall not be made without prior written approval of the Architect.

3.5 SEISMIC REQUIREMENTS:

- A. All new electrical equipment, wiring and conduit shall be installed to resist vertical and lateral forces in accordance with the State Building Code and applicable regional seismic codes, with the exception of the following: All electrical conduit less than 2-1/2" inside diameter.
- B. Where seismic restraints are installed, the spring vibration isolators or other restraint assembly shall be designed and installed in accordance with the manufacturer's specifications. The restraint assembly shall be designed to withstand the seismic lateral forces established in the State Building Code for a Zone 2 seismic area.
- C. Provide seismic snubbers, separate from spring isolators, for attachment to machinery and equipment bases, designed to provide seismic restraint in all modes (directions) in accordance with the State Building Code and applicable regional seismic codes. These snubbers shall have no contact with equipment during normal operation and shall have minimum clearances of 1/4" in all directions. Seismic snubbers shall be installed in strict accordance with the manufacturer's recommendations.
- D. Anchorage of Equipment to Housekeeping Pads: Place floor mounted equipment on 4" high concrete housekeeping pads properly doweled or expansion shielded to the floor to meet acceleration criteria. Anchor isolators and/or bases to housekeeping pads. Concrete work shall be provided by other Divisions.

- E. Anchorage of Housekeeping Pads: All concrete housekeeping pads must be anchored to the structure to meet acceleration criteria. This Contractor shall coordinate this with other Divisions.
- F. Acceptable Manufacturers: Subject to compliance with requirements, provide seismic restraint and isolation products of one of the following manufacturers.
 - 1. Mason Industries, Inc.
 - 2. Vibration Eliminator Co., Inc.
 - 3. Vibration Mountings and Controls, Inc.
- G. Submit product data and details of all seismic restraints and isolators.
- H. Each recessed fluorescent light fixture installed on four sides in a seismically supported suspended ceiling grid shall be secured to the ceiling grid with four hazard clips.

3.6 QUIET OPERATION:

- A. All equipment and material provided by the Contractor shall operate under all conditions of load without any sound or vibration which in the opinion of the Architect is objectionable. Where sound or vibration is objectionable in the opinion of the Architect, the Contractor shall eliminate it in a manner approved by the Architect.

3.7 PAINTING:

- A. Other Divisions shall clean and paint all new exposed, unpainted, non-galvanized, ferrous metal surfaces of pipes, conduits, equipment, hangers, supports and accessories with one (1) prime coat and two (2) finish coats. Coordinate all requirements well in advance.

3.8 CLEANING OF EQUIPMENT:

- A. Clean exposed equipment and fixtures. Repair damaged finishes and leave everything in working order satisfactory to the Architect.
- B. Thoroughly clean all equipment inside and outside of all foreign substances before being placed into operation. If any part of a system should be stopped by any foreign matter after being placed in operation, the system shall be disconnected, cleaned and reconnected wherever necessary to locate and remove obstructions. Any work damaged in the course of removing obstructions shall be repaired or replaced when the system is reconnected, at no additional cost to the Owner.

3.9 TESTS:

- A. All equipment shall be tested as determined by all authorities having jurisdiction, but in no case less than that specified under each section of the Specifications. Labor, materials, instruments and power required for testing shall be furnished by the Contractor, unless otherwise indicated under the particular section of the Specifications.
- B. Tests shall be performed to the satisfaction of the Architect and such other parties as may have legal jurisdiction.

- C. All defective work shall be promptly repaired or replaced and the tests shall be repeated until the particular system and component parts thereof receive the approval of the Architect.
- D. Any damages resulting from tests shall be repaired and damaged materials replaced, all to the satisfaction of the Architect.
- E. Equipment and systems which normally operate during certain seasons of the year shall be tested during the appropriate season. Tests shall be performed on individual equipment, systems and their controls. Whenever the equipment of a system under test is interrelated with, and depends upon, the operation of other equipment, systems and controls for proper operation, functioning and performance, the latter shall be operated simultaneously with the equipment or system being tested.

3.10 SUSPECTED EXISTING MATERIALS:

- A. Should asbestos or suspected asbestos be encountered during the course of the work, immediately discontinue all work in that area and report the condition to the Owner for resolution.
- B. All such suspected asbestos shall be reviewed and removed as required by the Owner under a separate contract by other contractors engaged directly by the Owner.
- C. No work in the area shall proceed until suspected asbestos is reviewed, all work on such has been completed, and the Owner notifies the Contractor to proceed accordingly.
- D. Should PCB be encountered during the course of the work in existing ballasts, transformers, etc., the Contractor shall remove from the site and properly dispose of, in accordance with all State and local codes.

3.11 REMOVED EQUIPMENT:

- A. All existing material or equipment replaced or superseded by the Contractor's work shall be removed by the Contractor in an approved manner and the existing structure and surfaces shall be restored by the Contractor to match the finished product. All removed equipment shall remain the property of the Owner and shall be carefully stored at the job site or removed from the premises by the Contractor as directed by the Owner.

3.12 RELOCATED EQUIPMENT:

- A. All equipment, scheduled for relocation, shall be carefully removed by the Contractor and stored in a protected manner until relocated. Any damage done to relocated equipment during removal, storage or relocation shall be corrected by the Contractor in an approved manner, including repair or replacement, as directed by the Architect.

3.13 INSTALLATION OF LABELS AND MARKERS:

- A. Decrease and clean surfaces to receive nameplates and labels.
- B. Install nameplates (and tape labels) parallel to equipment lines.

- C. Secure nameplates to equipment fronts using screws, rivets, or adhesive. Secure nameplate to inside face of recessed panelboard doors in finished locations.
- D. Embossed tape will not be permitted for any applications.
- E. Apply typed tape labels to inside of all receptacles and light switchplates to indicate panel and circuit that items is fed from.
- F. Provide wire markers on each conductor in panelboard gutters, pullboxes, junction boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits.
- G. Nameplate Engraving Schedule
 - 1. Provide nameplates of minimum letter height as schedule below.
 - 2. Panelboards, switchboards and motor control centers: 1/4 inch; identify equipment designation 1/8 inch; identify voltage rating and source.
 - 3. Individual circuit breakers, switches, and motor starters in panelboards, switchboards, and motor control centers: 1/8 inch; identify circuit and load served, including location.
 - 4. Individual circuit breakers, enclosed switches, and motor starters: 1/8 inch; identify load served.
 - 5. Transformers: 1/4 inch; identify equipment designation. 1/8 inch; identify primary and secondary voltages, primary source and secondary load and location.

3.14 DESIGNATIONS:

- A. This contractor shall confirm in writing all rooms, name, number and area designations with the Architect prior to final usage for any system. Contractor may utilize designations on drawings as a temporary measure but final usage must be confirmed with the Architect.

END OF SECTION 26 00 50

SECTION 26 00 60

ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1, General Requirements, apply to work specified in this Section.
- B. The requirements specified in Section 26 00 50, "Basic Electrical Requirements", apply to this Section.

1.2 INCLUDED IN THIS SECTION:

- A. Complete Secondary Distribution System
- B. Panelboard and Circuit Breakers
- C. Feeders and Branch Circuits
- D. Receptacles and Switches
- E. Lighting Fixtures and Lamps
- F. Empty Raceways and Outlets for Telephone System.
- G. Wiring for all electrical equipment being furnished by others, including temperature control panels (low voltage wiring shall be provided by the Division supplying the equipment)
- H. Testing and Load Balancing
- I. Removal of all Existing Electrical Equipment

1.3 DESCRIPTION OF WORK:

- A. This Section includes furnishing all labor and material to complete and make ready for operation by the Owner all electrical work as shown on the Drawings and as described in these specifications. It is the intent of these documents to terminate with complete, operational electrical systems within the building and on the project site.
- B. Panelboards shall be dead front type equipped with thermal-magnetic molded case circuit breakers designed for operation on 120/240 volt system as manufactured by Square D, General Electric, or Cutler Hammer.
- C. Wiring devices shall be of the type as indicated on the Drawings, and shall be manufactured by P&S, Hubbell, or Leviton.

- D. Lighting fixtures shall be in strict compliance with the latest National Electric Code and Local Utilities' Energy Conscious Construction Program..

1.4 CODES, REGULATIONS AND STANDARDS:

- A. The electrical installation shall be in accordance with the current rules, regulations and recommendations of the local electrical inspection authority, the National Fire Protection Association, The National Electric Code, the Electric Utility Company furnishing service, Local and State Ordinances. In the event of a conflict in code requirements, the local code shall apply. All permits and certificates as required shall be obtained and paid for by this Contractor. Approved Inspection Certificates by the authorities having jurisdiction shall be furnished with request for final payment.
- B. All material and equipment shall conform to the applicable standards (current edition) of the following organizations.
1. National Electrical Manufacturers Assoc. (NEMA)
 2. Underwriters Laboratories (UL)
 3. Insulated Power Cable Engineers Assoc. (IPCEA)
 4. Institute of Electrical & Electronics Engineers (IEEE)
 5. American Society for Testing Materials (ASTM)
 6. Federal Specifications (U.S. Department of Commerce)
 7. Illuminating Engineers Society (IES)

1.5 SCOPE OF WORK:

- A. This Section includes the providing of all labor, materials, fixtures, equipment, accessories, services and tests necessary to complete and make ready for operation by the Owner all electrical work as shown on the Drawings and described in these Specifications. It is the intent of these Documents to terminate with complete, operational electrical systems within the building.
- B. The work shall include but not be limited to the following:
1. Secondary Distribution System complete.
 2. Panelboard and Circuit Breakers.
 3. Feeders and Branch Circuits.
 4. Receptacles, switches and outlets complete with cover plates.
 5. All lighting fixtures and lamps.

6. Wiring for all electrical equipment being furnished by Owner or other Divisions including temperature control panel (low voltage wiring shall be provided by the Division supplying the equipment).
 7. Testing and load balancing.
 8. Shop drawings and Record Drawings.
 9. Removal of all existing Electrical Equipment as noted on the Drawings and as indicated in Specifications.
- C. Furnish all labor, materials, tools, transportation, equipment, services and facilities required for the complete and proper installation of all electrical work. All fixtures, devices and equipment shown, noted or required on the drawings and/or contained herein shall be connected from the source of electric power to the final connection, tested and made ready for satisfactory operation.
- D. This Section shall be responsible for knowledge of the areas that may affect his work for coordinating with the local inspection authorities and with all other trades on this project. This Section shall thoroughly coordinate all work with other Divisions and shall ensure that all equipment requiring electrical work be wired and incorporated as required in the basic work of the project.
- E. Make all field measurements and shall be responsible for their accuracy.
- F. The Specifications and Drawings are complimentary each to the other and that which is called for on one shall be as binding as if called for on both. In the event of a conflict, it shall be resolved by the Architect.
- G. Any violation of the applicable electrical code standards or conflict between Drawings and Specifications not called to the attention of the Architect before the contract is executed shall be corrected at this Contractor's expense.
- H. This Section hereby waives all claim to extra compensation for work performed and materials furnished beyond the scope of the contract without written authorization by the Architect.
- 1.6 WORK BY OTHERS:
- A. For installation of temperature control wiring, refer to other Divisions. Finish painting, cutting, patching, excavation and backfilling shall by other Divisions.
- 1.7 INSPECTIONS:
- A. This Section shall be responsible for the proper inspection of his work during its installation by all lawful authorities, shall take out and pay for all necessary permits, inspection fees and comply with all laws relating to persons employed on this work.

1.8 SHOP DRAWINGS:

- A. Submit five (5) copies of Product Data to the Architect in accordance with Section 26 00 50 Basic Electrical Requirements.
- B. Submittals shall be given to the Architect for the following materials.
 - 1. Panelboard.
 - 2. Devices.
 - 3. Lighting Fixtures and Ballasts.
 - 4. Miscellaneous Electrical Equipment
 - 5. MC Cable.
 - 6. Smoke/Carbon Monoxide & Heat Alarms.
 - 7. Fan Forced Electric Heater.

PART 2 - PRODUCTS

2.1 CIRCUIT BREAKER PANELBOARDS:

- A. Furnish and install circuit breaker lighting panelboards as indicated in the panelboard schedule and where shown on the plans. Panelboards shall be equipped with thermal-magnetic molded case circuit breakers with frame and trip ratings as shown on the schedule.
 - 1. Circuit Breakers: Circuit breakers shall be quick-make, quick-break, thermal-magnetic, trip indicating, and have common trip on all multipole breakers. Trip indication shall be clearly shown by the breaker handle taking position between ON and OFF when the breaker is tripped. Branch circuit breakers feeding convenience outlets shall have sensitive instantaneous trip settings of not more than 10 times the trip rating of the breaker to prevent repeated arcing shorts resulting from frayed appliance cords. UL Class A (5 milliampere sensitivity) ground fault circuit protection shall be provided on 120 Volt AC branch circuits as specified on the plans or panelboard schedule. This protection shall be an integral part of the branch circuit breaker which also provides overload and short circuit protection for branch circuit wiring. Tripping of a branch circuit breaker containing ground fault circuit interruption shall not disturb the feeder circuit to the panelboard.

A single pole circuit breaker with integral ground fault circuit interruption shall require no more panelboard branch circuit space than a conventional single pole circuit breaker. Connections to the bus shall be bolt-on. (Provide interrupting capacity for all circuit breakers equal to or greater than the panel bus interrupting capacity). Where circuit breakers are used for switching lighting, provide "SWD" type breakers approved for that purpose as required, whether indicated or not.

2. Panelboard Bus Assembly: Bus bar connections to the branch circuit breakers shall be the "distributed phase" or "phase sequence" type. Single phase, three-wire panelboard bussing shall be such that any two adjacent single-pole breakers are connected to opposite polarities in such a manner that two-pole breakers can be installed in any location. Three-phase, four-wire bussing shall be such that any three adjacent singlepole breakers are individually connected to each of the three different phases in such a manner that two or three-pole breakers can be installed at any location. All current-carrying parts of the buss assembly shall be plated. Mains ratings shall be as shown in the panelboard schedule or on the plans.
3. Wiring Terminals: Terminals for feeder conductors to the panelboard mains and neutral shall be UL listed as suitable for the type of conductor specified. Terminals for branch circuit wiring, both breaker and neutral, shall be UL listed as suitable for the type of conductor specified.
4. Circuit Numbering: Panelboard circuit numbering shall be such that starting at the top, odd numbers shall be used in sequence down the left and side and even numbers shall be used in sequence down the right-hand side.
5. Cabinets and Fronts: The panelboard bus assembly shall be enclosed in a steel cabinet. The size of the wiring gutters and gauge of steel shall be in accordance with NEMA Standards Publication No. PB1-1977 and UL Standards No. 67 for panelboards. The box shall be fabricated from galvanized steel or equivalent rust-resistant steel. Fronts shall include door in a door assemblies and have flush, stainless steel, cylinder tumbler-type locks with catches and spring-loaded door pulls. The flush lock shall not protrude beyond the front of the door. All panelboard locks shall be keyed alike. Fronts shall have adjustable indicating trim clamps which shall be completely concealed when the doors are closed. Doors shall be mounted by completely concealed steel hinges. Fronts shall not be removed with door in the locked position. A circuit directory frame and card with a clear plastic covering shall be provided on the inside of the door. The directory card shall provide a space at least 1/4" high x 3" long or equivalent for each circuit. The directory shall be typed to identify the load fed by each circuit. Fronts shall be of code gauge steel.
6. Equipment Short Circuit Rating: Each panelboard, as a complete unit, shall have a short circuit current rating equal to or greater than the Utility Company rating at the secondary side of the transformer (no series ratings). In the event that equipment with a short circuit rating equal to or greater than the Utility Company rating at the secondary side of the transformer is unavailable, the contractor shall provide a detailed short circuit analysis for any equipment not meeting the required rating. The short circuit analysis shall indicate the available short circuit current at the transformer, the primary line to line voltage of the transformer, KVA rating of the transformer, impedance (%Z) of the transformer, the length of each cable run including the number of conductors and the available short circuit current at each piece of equipment.
7. UL Listing: Panelboards shall be listed by Underwriters Laboratories and bear the UL label. Panelboards shall be Square D, Cutler Hammer or General Electric, and designed for operation on 120/240 volts.

8. Dwelling Unit Panels:

- a. Load centers shall have main ratings and branch circuit breaker ratings sized and numbered as indicated on the drawings. Load centers shall be plug-on type construction. All current carrying parts of the bus assembly shall be plated. Terminals for feeder conductors to mains and branch neutral shall be UL listed as suitable for the type conductor specified. The load center bus assembly shall be enclosed in a steel cabinet. The size of the wiring gutters and gauge steel shall be in accordance with UL Standards No. 67 and No. 50. Fronts shall include door and be provided with a directory for circuit identification. Load center boxes and fronts shall have corrosion resisting phosphate treatment and a gray baked enamel finish. Load centers shall be UL listed and meet Federal Specification W-P-115b as Type 1, Class 2.
 - b. Branch circuit breakers up to 150 amperes shall be Square D type QO, Q1 or approved equal. All breakers shall be plug-on type, toggle action with quick-make quick-break mechanism. Trip indication shall be clearly shown on the breaker handle taking a position between "ON" and "OFF" when the breaker is tripped. All multi-pole breakers shall be single operating handle, common trip variety. Branch circuit breakers feeding convenience outlets shall have sensitive, instantaneous trip in order to give "flash protection" for frayed, stranded wire cords.
 - c. Load centers shall have a series rated short circuit ratings.
- B. UL Listing: Panelboards and load centers shall be listed by Underwriters Laboratories and bear the UL label and designed for operation on 120/208 volts. Panelboards and load centers shall be Square D, Cutler Hammer or General Electric.

2.2 CONDUIT - RACEWAY AND FITTINGS:

- A. All raceways under slab on grade or in soil shall be rigid steel conduit and coated with asphaltum.
- B. All raceways in masonry, not noted otherwise, shall be run in Electrical Metallic Tubing (EMT) or rigid steel conduit. Raceways above ceilings shall be Electrical Metallic Tubing.
- C. Armored cable type MC with ground wire may be used for all power receptacle and lighting branch circuit wiring run in masonry and within furred ceilings or furred walls. MC cable shall not be embedded in concrete slabs or run underground.
- D. Armored cable type MC with ground wire may be used in furred ceiling and hollow stud wall construction as approved by local inspection authorities for power and lighting branch circuits only.
- E. Minimum size shall be 3/4" trade size unless otherwise noted.
- F. Exterior exposed raceways shall not be permitted unless specifically indicated otherwise.

2.3 GROUNDING AND BONDING:

- A. Furnish and install an electrical grounding and bonding systems with assembly of materials, including, but not limited to, cables/wires, connectors, solderless lug terminals, grounding electrodes and plate electrodes, bonding jumper braid, surge arresters, and additional accessories needed for a complete installation. Where materials or components are not indicated, provide products which comply with NEC, UL, AND IEEE requirements.

2.4 WIRING:

- A. Single conductor cables shall be used for feeders and branch circuit wiring. Minimum wire size shall be No. 12 A.W.G. unless indicated otherwise. Wire sizes No. 8 A.W.G. and smaller shall be solid. No. 6 A.W.G. and larger shall be stranded. All conductors shall be of 98 percent conductivity copper only.
- B. All wiring shall be 600 volt dual coded type "THHN/THWN". Wire of higher temperature ratings shall be used where required by National Electrical Code, Special Conditions and as described in the contract Drawings. Wiring shall be kept clear of heating and hot water lines a minimum of 6 inches.

2.5 LIGHTING FIXTURES:

- A. Furnish and install lighting fixtures, lighting equipment and lamps and/or tubes for all lighting outlets as shown on the plans and listed in the "Fixture Schedule".
- B. Furnish and install all mounting accessories, brackets, stems, etc., required for the complete installation of the lighting fixtures.
- C. Fluorescent lamps to be General Electric, (energy saving Type 'T8'), Philips or Sylvania rapid start. (3000⁰ Kelvin).
- D. All ballasts in fluorescent fixtures shall be electronic type with low harmonics (10% maximum) to comply with Local Utility Rebate Program.
- E. Each lighting fixture shall be U.L. listed. Any fixture with a listing / label other than UL shall have the manufacturer obtain written approval of the Authority Having Jurisdiction for such products acceptability to state and local codes prior to shop drawing submittal; submit approvals.

2.6 WIRING DEVICES:

- A. Where shown on the plans, furnish and install wiring devices indicated by the symbols and symbol list.
- B. Wiring devices shall be of the type as specified herein and shall be as manufactured by Pass & Seymour, Hubbell, or Cooper. Numbers specified refer to Pass & Seymour. Color ivory, confirm color with Architect.

Wall Switches, 20A, 120V
Receptacles (Grounding)

20ACI-1 Series

15 AMP 125V, Duplex	TR5262-I
20 AMP 125V, Duplex	TR5362-I
20 AMP, 120V, Ground Fault	2095 TR-I
30 AMP, 240V, 2-Pole, Single	3801
60 AMP, 240V, 3-Pole, 4 Wire	3871
20 AMP, 125V, Exterior Duplex	2095TRWR-I

- C. Plates shall be stainless steel, satin finish, Pass & Seymour S-IN Series.
- D. Provide draft barriers on all devices mounted or located in an exterior wall (Lessco Box #5700.01).
- E. Exterior receptacles shall have metal in-use type cover plates (Intermatic model #WP1250MVXD).

2.7 OUTLET BOXES:

- A. Outlet boxes and covers shall be pressed steel, except as noted, and protected against corrosion with zinc applied by the electric galvanizing, hot dipping or sherardizing process.
- B. Outlet boxes shall be of sizes and type to accommodate: (1) structural conditions, (2) size and number of raceways and conductors or cables entering, and (3) device or fixture for which required. Size of box to match size of device with no overhang. Surface mounted equipment shall be furnished with applicable surface type box semi-flush mounted equipment shall be furnished with applicable semi-flush type box and trim.
- C. Outside lighting outlets shall have galvanized or cadmium plated cast iron boxes with gaskets, drilled and tapped to take fixture specified for these locations.
- D. Pull and splice boxes are not indicated on drawings but shall be provided as required for splice and ease of pulling conductors and NEC requirements.

2.8 MISCELLANEOUS STEEL AND HARDWARE:

- A. Furnish and install all the necessary steel for supporting lighting fixtures, panels, starters, disconnects, conduit etc. "Kindorf" framing systems, rods, channels, and fittings with galvanized or cadmium finish shall be used. Unprotected ferrous metals shall not be permitted.

2.9 METERING EQUIPMENT:

- A. Furnish and install new exterior rated 120/240volt, 200 AMP bypass meter socket (approved by United Illuminating) as indicated on the plans, new meter shall be provided by United Illuminating, coordinate.

PART 3 - EXECUTION

3.1 CONDUIT - RACEWAY AND FITTINGS:

- A. All metal conduit, enclosures and raceways for conductors shall be mechanically joined together to form a continuous electrical continuity and bond and shall be grounded as required by National Electrical Code.
- B. All conduit shall be concealed where possible and so installed so as not to damage or run through structural members.
- C. In unfinished areas, when conduits can not be concealed, exposed conduit shall be run parallel with or at right angles to the walls of the building. Check the structural details and plans so that all conduits can be concealed, except conduits on surface-mounted panels and boxes and other locations as outlined in these specifications.
- D. In finished areas, when conduits can not be concealed, furnish and install surface metal raceway as manufactured by Wiremold. Raceways, elbows, and fittings shall be designed for use together. They shall be sized as approved for the number of wires as indicated. Runs shall be parallel or at right angles to walls or partitions.
- E. All conduit shall be supported by approved hangers, racks, clamps or clips fastened to expansion inserts or lead anchors. Spacing of supports for conduits and raceways shall be in accordance with the National Electrical Code.
- F. All conduit runs in slab shall be separated as much as possible.
- G. Conduits shall be in full lengths wherever possible. All conduits shall be plugged with approved discs during construction and be dry and clean before pulling wires.
- H. All conduits that are laid underground, in concrete floor slabs and in building walls shall be approved by authorized inspectors before they are covered up in any way. Conduits installed in concrete shall be in accordance with standards of the American Concrete Institute. The size of conduit and locations which can be installed in any slab shall be determined by the Structural Engineer's requirements of the amount of concrete over and under the slab reinforcements, allowing a minimum cover of 1" over surface. Check the Structural and Architectural drawings and specifications before time of bidding, to verify all conditions.
- I. The inside and outside of all steel and flexible conduit, including factory-make elbows, and of all boxes and fittings, including bolts and screws, shall be protected against corrosion by an even coating of zinc.
- J. Where raceways are cut in the field, they shall be square cut using approved cutter. The cut ends shall be reamed to remove burrs and sharp edges. Threads cut on conduit in the field shall have the same effective length and the same thread dimensions and taper as the factory-cut conduit threads.
- K. Raceways shall be joined by means of threaded couplings or unions. Joints shall be set up tight. Runs shall be straight and true. Elbows, offsets and bends shall be uniform and symmetrical.

- L. All raceways shall be cleaned, prior to pulling in wire and cable. This cleaning shall remove all foreign matter, including water, from the raceways. All boxes in which the raceway terminates shall be cleaned of all concrete, mortar or other foreign matter and all threads in boxes shall be left clean and true upon completion of the work.
- M. Wiring above ceiling from junction box to lighting fixtures may be run in flexible metal conduit not exceeding 72" length.
- N. Conduits going through expansion joints of the building shall be equipped with expansion fittings as manufactured by O-Z, or approved equal.
- O. Joints shall be set up tight. Couplings, connectors and fittings shall be approved types designed for the purpose.
- P. Furnish and install separate ground wire in all EMT to ground all equipment and devices.

3.2 LIGHTING FIXTURES:

- A. All joints in fixture wiring shall be made with solderless connections.
- B. Fixture wire shall be in strict compliance with the latest National Electrical Code. No fixture wiring shall be smaller than #16 AWG. Wiring shall be protected with tape or tubing at all points where abrasions are likely to occur. All wiring shall be concealed within fixture construction.
- C. All fixture units, when installed, shall be free from warps, dents, etc. They shall be clean of dirt, smudges and all foreign matter, and shall be left highly polished.
- D. Furnish, install and wire a light fixture at every outlet as indicated on the plans. In the event a fixture type designation is omitted from the drawing, furnish and install the type as designated by the Owner or Engineer.
- E. Lighting fixtures shall not be installed until finished coat of paint has been applied to ceilings and walls and allowed to dry thoroughly.
- F. Upon completion of the installation of the lighting fixtures and lighting equipment, they must be in first-class operating condition and in perfect condition as to finish, etc. At time of final inspection, all fixtures and equipment must be complete with lamps, starters and required glassware or reflectors, which must be clean and free from defects. Any fixtures, reflectors or glassware broken prior to the time of final inspection must be restored without cost to the Owner.
- G. Adjustable lighting fixtures shall be focused and adjusted as directed by the Owner or Engineer.
- H. All Lighting fixtures shall be independently supported apart from general ceiling construction.
- I. Verify all ceiling types and construction before ordering lighting fixtures to confirm that final ceilings approved for installation and lighting fixtures are compatible to each other in all respects.

- J. All fixtures shall be supported from the building structure, independent of hung ceiling.
 - 1. Surface mounted luminaries shall be mounted on backboxes which are securely attached to the building structure with a 12 gauge safety wire.
 - 2. Install recessed 1 x 4 luminaries to permit removal from below. Install grid clips to securely fasten fixture to framing members. Luminaries to be supported at each corner individually from the building structure with a 12 gauge safety wire.
 - 3. Each recessed downlight shall be supported with a 12 gauge safety wire from the building structure and supported on the grid using hanger bars and 'T' bar mounting clips.
 - 4. Contractor to ensure height of all lighting fixtures complies with code required egress height requirements. Contractor to revise fixtures quantity and location as required to comply.
- K. The Electrical Contractor shall remove all existing lighting fixtures in areas where indicated on plans, and will be replaced by new. Clean and relamp existing fixtures that are indicated to remain. All fixtures removed shall be stored or disposed of as directed by the Owner.
- L. All new fixtures replacing existing fixtures, either at existing locations where fixtures are removed or at new locations, shall be properly supported, providing any necessary hardware required to complete the installation.
- M. All lighting fixtures shall be supplied to the site in individual cartons.

3.3 BRANCH CIRCUITS AND FEEDERS:

- A. Furnish and install all conduits, outlets and wiring for all power, lighting, control, equipment and motor circuits as shown on plans and/or as herein specified. Final connections to all equipment shall be made under this Division unless otherwise specifically noted elsewhere.
- B. The Minimum size of wire for light or power shall be as scheduled below for the entire distance of the circuit. (Circuits to have hot leg, neutral and ground unless otherwise noted). Wire sizes #14 through #10 shall be solid except as otherwise indicated. Wire sizes #8 and larger shall be stranded. All sizes called for in the specifications or on the plans are American Wire Gauge sizes.

1.	120V/240V 1P 15 & 20A Circuits:	
	LENGTH OF BRANCH CIRCUITS	REQUIRED WIRE SIZE
	0 - 80'	#12's
	81' - 140'	#10's
	141' - 225'	#8's
	226' - 360'	#6's

NOTES:

1. Wire sizes indicated shall be for the entire length of the circuit (from the circuit breaker in the panel board to the last device connected to the circuit).
 2. Minimum wire size indicated unless otherwise noted on plans.
 3. All other Branch Circuit, panel and equipment wire sizes shall be calculated to maintain a maximum voltage drop of 3% (from the circuit breaker in the panel to the first device connected to the circuit) as recommended by article 220.19(A) FPN No. 4 of the 2005 National Electrical Code. Voltage drop shall be calculated using thermal resistances derived from table 310.16 from the 75 degree column, using the Neher - McGrath equation and using an ambient temperature rating of 30 degree C (86 degree F) with an amperage based on 80% of the branch over current protection device in the panel schedule.
 4. When running more than 3 current carrying conductors in a conduit or raceway. Contractor to ensure all requirements for derating are met per article 310.15(B)(2) using table 310.15(B)(2)(a) of the 2005 National Electrical Code.
- C. All wire shall be factory color-coded with a separate color for phase, switch and neutral used consistently throughout. The neutral wire of all branch circuits shall be white. Green shall be used for equipment grounding conductors. Feeders shall be phase color coded at all access points.
- D. The installation of wires and cables includes all splicing of the wiring and cables to each other an connecting them to panelboards, receptacles, switches, controls, lighting fixtures, motors and all other electrical apparatus.
- E. Branch circuits shall be arranged to balance the loads on the phases of the panelboard feeders. Where 120 volt, three or four wire circuits are indicated, the circuit shall consist of separate phases and a common neutral. (Circuit numbers shown on drawings are for identification only.) Maximum unbalance shall not exceed 10 percent.
- F. All wires and cables shall be continuous from origin to destination without running splices. At the end of these wires and cables a sufficient slack shall be left as may be required for making proper connections.
- G. Flexible conduit shall be installed at all motor connections to prevent transmission of noise and vibration; 24" maximum length.
- H. Starters and controls shall be rigidly secured and installed plumb and level.
- I. Manually operated devices such as pushbuttons and manual starters shall be provided under this Division and shall be located to permit convenient operation and be readily accessible and shall have pilot light for "ON" operation. Furnish engraved plastic nameplates for each control station.
- J. Disconnect devices shall be provided under this Division of the specifications to comply with all requirements of the National Electrical Code. Disconnects shall be horsepower rated, quick-make, quick-break mechanisms with provisions for locking the operating handle in the open position.

- K. Joints, taps, and splices in wires #8 AWG and larger shall be made by solderless pressure lug. Joints, taps and splices in wires #10 AWG or smaller, shall be made by solderless connectors.
- L. Conduits must be swabbed out and made thoroughly dry before pulling wire and cable.
- M. No grease or other compound which contains acids shall be used in pulling wires and cables.
- N. Where solid conductors are to be connected directly to the devices without the use of lugs, such as occurs at lighting switches and plug receptacles, the wire shall be formed into a loop to fit around the screw.
- O. All switches controlling lighting fixtures or split wired receptacles for portable lighting equipment shall be provided with a neutral wire located in the switch box for connection of future electronic lighting control equipment. Neutral wire shall be capped for future use, provide tag with permanent marking "Neutral conductor".
- O. This Division shall snake all existing block, wall and wood wall for installation of new wiring and conduits as required to extend new work in existing areas.

3.4 WIRING DEVICES:

- A. Where more than one switch is shown at one outlet, they shall be installed under one plate in an order appropriate to the location of the outlet controlled.
- B. All devices installed back to back in a common partition shall be offset by 18" minimum.

3.5 GROUNDING AND BONDING:

- A. All non-current carrying metallic parts of electrical equipment, machines, appliances and conduits shall be securely grounded to a common ground bus and ground shall be connected to the water main, with a copper or brass pipe clamp, on the street side of the water service; jumpers shall be installed by-passing all valves.
- B. All grounding conductors shall be made with as few connections as possible. All connections shall be made with an approved type of solderless connector and shall be protected from mechanical injury.
- C. All contact surfaces shall be thoroughly cleaned before connection is made so as to insure a good metal-to-metal contact. Connections shall be readily accessible for inspection.
- D. The ground and bonding systems shall be in strict accordance with the latest edition of the National Electrical Code.

3.6 OUTLET BOXES:

- A. Outlet boxes and fittings shall be installed at each outlet switch or junction point of conduit.

- B. Boxes shall set plumb and true in building surface and furnished with suitable plaster rings where so required.

3.7 LOCATION OF OUTLETS:

- A. Coordinate work with other trades involved so that exact locations may be obtained for all outlets, apparatus, appliances and wiring. The locations shown on the plans are subject to modifications due to conditions arising as construction progresses, such as swing or doors, layout of furnishings, locations of partitions, etc. Such changes shall be observed and executed as part of this contract. Verify all locations shown in accordance with the General Plans before installing work, correcting such discrepancies as they arise during the installation, without additional cost to the Owner.
- B. Dimensions shall be given by the Architect where same are necessary to suit equipment layouts. Verify the locations of work with all other trades previous to installation, and assign space requirements and locations so that there will be no conflicts in space requirements of each trade. The accompanying plans indicate approximately the layout of the work to be done. Exact locations shall be, in all instances, as designed or as centered on the job from measurements given by the Architect. Installation and location of outlets in equipment rooms shall be made after other locations of piping and equipment have been established to avoid interferences.

3.8 SERVICE:

- A. The service shall be as indicated on the Drawings and shall meet all National and Local Codes and the Utility Company's requirements.
- B. The Utility Company will provide overhead facilities, underground primary cables, main transformers, primary protective and disconnect devices, and current metering transformers, all generally as indicated on the plans. The Electrical Contractor shall provide secondary work from main transformer and ground grid. However, this Contractor shall be responsible for the entire service installation and shall include therefore all charges from the Utility Company for service installation, including inspection fee, if any, in the bid.
- C. Provide metering sockets, current transformer provisions, all in type and style as approved by the Utility Company and located as shown on the drawings.
- D. Secondary service characteristics shall be 120/240 volt, 1 phase, 3 wire.

3.9 PANELBOARDS:

- A. Panels shall be surface or recessed mounted with type, size, and number of branch circuit breakers as shown on Plans. All panelboards shall be aligned leveled and securely fastened to the building as recommended by the manufacturer and in accordance with State seismic requirements. Surface mounted panels shall be mounted at least 1" off the wall on suitable backboard which shall not block the vertical flow of air in back of panel. Flush mounted panels shall be installed to align with finished wall surfaces.

- B. Identify panelboards with laminated plastic name plates with engraved letters. Attach with screws.
- C. Typewritten circuit schedules in panelboard shall identify panelboard and each branch breaker.
- D. All new panels replacing existing panels shall be aligned, leveled and securely fastened to the building. Surface mounted panels shall be mounted at least 1" off the wall on suitable backboard which shall not block the vertical flow of air in back of panel. Flush mounted panels shall be installed to align with finished wall surfaces.

3.10 WIRING FOR EQUIPMENT:

- A. Whether specifically indicated or not, furnish and install all wiring and connect to all equipment and controls as required, and in accordance with the shop drawings and diagrams to be provided by other divisions and other manufacturers.
- B. All roughing work shall be installed in accordance with final dimensioned equipment shop drawings.

3.11 CUTTING AND PATCHING:

- A. All necessary cutting and patching of the existing structures for the reception of the work under this contract shall be by the General Contractor. All patching of existing structure shall be by the General Contractor. All patching of existing structure shall be by the general contractor.
- B. Provide all required sleeves, forms and inserts before new walls, partitions, floors or roof are built. All cutting and patching of walls, partitions, ceilings and floors necessary for reception of work, caused by failure to provide or properly locate sleeves, forms and inserts, or caused by incorrect location of work shall be done at the expense of this Contractor. No cutting of finished or structural work may be done without approval of Owner.
- C. This Contractor shall locate all sleeves and shall cooperate with other contractors so that all conduit runs shall be coordinated and arranged in a neat and workmanlike manner.
- D. When it is necessary to have finished material cut, drawings shall be submitted to the Architect showing work required, and his approval shall be obtained before doing such cutting.
- E. Openings in walls and floors, in new construction for electrical work shall be provided by this Contractor, but this Contractor shall furnish exact dimensions and locations of these openings to suit the type of unit to be used.

3.12 ALTERATIONS:

- A. Certain removals and relocations of existing electrical work will be necessary to the satisfactory performance of the general work. All changes cannot be completely detailed on the drawings, but shall be taken into consideration in making up the work proposal.

- B. Continuous service is required on all circuits and outlets affected by these changes, except where the Owner will permit outage for a specific time. Obtain Owner's written consent before removing any circuit from continuous service.
- C. Wherever it is required to disconnect or remove any part of an existing circuit, reconnect that circuit to re-establish service in the remaining portion of the circuit. Cut back to below floor, wall or ceiling and plug both ends of the concealed conduits made obsolete by alterations. Remove exposed conduits, wireways, outlet boxes, pull boxes, and hangers made obsolete by the alterations, unless specifically designated to remain.
- D. All thermostats, unit heaters, fans, etc., shall be removed or relocated by others. Electrical Contractor shall terminate and secure wiring where equipment is removed.
- E. The Electrical Contractor shall extend wiring and conduit and reconnect to any equipment relocated by other trades, like Division 15. All necessary hardware shall be provided under this Division to provide continuity in service of the circuit to be relocated equipment.
- F. The Electrical Contractor shall remove all existing lighting fixtures in areas where indicated on plans, and will be replaced by new. Provide suitable cover plates for each fixture outlet box where existing fixtures are removed. Terminate and secure wiring if required, or maintain continuity of service in circuit where other outlets are served by the circuit. All fixtures removed shall be stored or disposed of as directed by the Owners.
- G. All existing fixtures called for to be reused, shall be refurbished; clean, relamp and reballast the fixture and install at location as indicated, complete and in first class operating condition, providing all required accessories and hardware for a complete installation.
- H. Any outlet or switch occurring in a partition or wall being demolished shall be relocated to the nearest suitable location by extending the wiring and reconnecting as required at no cost to the Owner. Exact location of such an outlet shall be determined by the Architect.
- I. Verify conduit and cable sizes and capabilities of the existing installations with the information on the drawings.
- J. Where discrepancies between existing installations and data indicated on the drawings exist, notify Architect before the extension or replacement of existing conduit and cable work is started.
- K. Take possession and remove from the premises all abandoned materials and equipment not specified as returned to the Owner.
- L. Return to Owner portable equipment connected to outlets.

3.13 PERMANENT LABELS:

- A. Furnish and install permanent labels and markers in the following locations:

1. AIC RATINGS: Provide field installed labels indicating the available fault current at each service disconnect means, the available fault current shall be equal to the utility company transformer (coordinate with local utility company). Field installed labels shall indicate the date the fault current calculation was performed.

END OF SECTION 26 00 60